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Professional News Magazine

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Nov.-Dec. 1958

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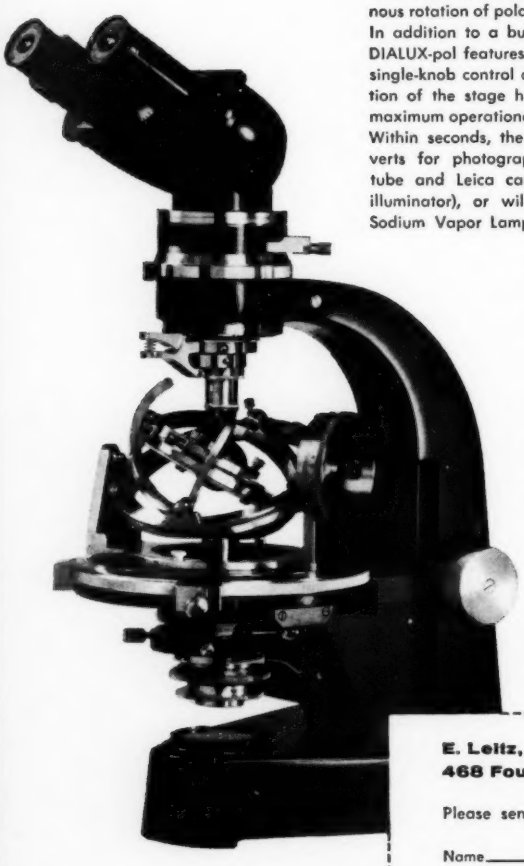

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Calendar

Cooperation of Society Secretaries in supplying meeting notices for GEOTIMES calendar is requested.

Dec. 26-30, 1958—AAAS: Section E. Symposium on History of American Geology; symposium on Experimental Geology and other sessions on geology and geography. Washington, D. C.

Dec. 29-30, 1958—AGT: Pacific NW Sect., Oregon State College, Corvallis, Ore. Geol.-Geog. Sect. of NW Scientific Assoc. meeting at the same time and place.

*Jan. 4-9, 1959—2nd CARIBBEAN GEOLOGICAL CONFERENCE, Mayaguez, Puerto Rico. Several field trips in connection. Inquire: Prof. John D. Weaver, Coll. of Agric. & Mech. Arts, University of Puerto Rico, Mayaguez, P. R.

Jan. 26-29, 1959—AMS: New York, N. Y.

Feb. 2-4, 1959—AAPG: Rocky Mountain Sect., 9th Ann. Convention, Civic Auditorium, Albuquerque, N. M.

Feb. 5-6, 1959—AGU: Pacific Southwest Region, Stanford, Calif.

Feb. 15-19, 1959—AIME: Annual Meeting, joint with SEcG, Hotels St. Francis, Sheraton-Palace, Sir Francis Drake, San Francisco, Calif.

Feb. 24-25, 1959—UNIVERSITY OF OKLAHOMA, 6th Biennial Geology Symposium, Norman, Okla.

Mar. 1-4, 1959—PROSPECTORS & DEVELOPERS ASSOC., 27th Ann. Mtg. and Convention, joint with Geol. Assoc. of Canada and Mineralogical Assoc. of Canada, Royal York Hotel, Toronto, Ontario.

Mar. 8-14, 1959—ASP-ACSM: Ann. Mtg., Shoreham Hotel, Washington, D. C.

March 16-19, 1959—AAPG-SEPM: 44th Annual Meeting, Memorial Auditorium, Dallas, Texas.

Mar. 30-Apr. 2, 1959—ASSOC. OF AMER. GEOGRAPHERS, Penn-Sheraton Hotel, Pittsburgh, Pa.

April 1-5, 1959—GSA: Cordilleran Sect., Tucson, Arizona.

April 2-3, 1959—AIME: SOC. PETR. ENG., Fifth Ann. Joint Mtg. of Rocky Mountain Petroleum Sects., Casper, Wyo.

April 2-4, 1959—OPTICAL SOCIETY OF AMERICA, Spring Mtg., New Yorker Hotel, New York.

*April 2-4, 1959—SEPM: Permian Basin Sect. Annual meeting, Roswell, N. M. Field trip to Sacramento Mountains area April 3 & 4.

April 5-10, 1959—AMER. CHEM. SOC., 135th Ann. Mtg., Boston, Mass.

April 13-14, 1959—LAKE SUPERIOR INSTITUTE ON GEOLOGY, University of Minnesota, Minneapolis, Minn.

April 13-15, 1959—CIMM: Ann. Gen. Mtg., Queen Elizabeth Hotel, Montreal, Quebec, Canada.

April 13-15, 1959—ASSOCIATION OF AMERICAN STATE GEOLOGISTS, Lawrence, Kansas.

April 16, 1959—OHIO ACAD. OF SCIENCE, Capital University, Columbus, Ohio.

April 16-18, 1959—GSA: Southeastern Section, Chapel Hill, N. C.

April 27-30, 1959—INTERNATIONAL SYMPOSIUM on Physical Chemistry of Extractive Metallurgy, Penn-Sheraton Hotel, Pittsburgh, Pa.

May 4-7, 1959—AGU: Annual Meeting, Washington, D. C.

May 7-8, 1959—AIME: SOC. PETR. ENG., Permian Basin Sect. Oil Recovery Conf., Midland, Tex.

May 14-16, 1959—GSA, Rocky Mountain Section, Montana State University campus, Missoula, Montana.

May 14-23, 1959—INTERNATIONAL PETROLEUM EXPOSITION, Tulsa, Okla. For reservations write: IPE Housing Bureau, Oil Capital Bldg., Tulsa, Okla.

May 30-June 6, 1959—5th WORLD PETROLEUM CONGRESS, Permanent Council, New York. Write: C. E. Davis, Gen. Sec'y, 527 Madison Ave., New York 22.

June 11-12, 1959—IUCr. Commission on Crystallographic Apparatus, two conferences at Karolinska Institutet, Stockholm, Sweden. Inquire: Dr. William Parrish, Philips Laboratories, Irvington-on-Hudson, New York

June 15-17, 1959—SECOND SYMPOSIUM on X-Ray Microscopy & X-Ray Microanalysis, Stockholm. Inquire: Dr. G. Hoglund, Inst. f. Medicinsk Fysik, Karolinska Inst., Stockholm 60, Sweden.

Aug. 24-30, 1959—5th CONGRESS OF THE INTERNATIONAL COMMISSION OF OPTICS, Stockholm, Sweden.

Aug. 30 - Sept. 12, 1959 — INTERNATIONAL OCEANOGRAPHIC CONGRESS, AAAS, UNESCO & ICSU special committee on oceanic research cooperating; United Nations Bldg., N.Y. Write: Dr. Mary Sears, Woods Hole Oceanographic Institution, Woods Hole, Mass.

October 8-10, 1959—OPTICAL SOC. OF AMERICA, Ann. Mtg., Chateau Laurier, Ottawa, Canada.

Dec. 12-13, 1959—OKLAHOMA ACAD. OF SCIENCE, Earth Science Sect., Ann. Mtg., Weatherford, Okla.

July 25-Aug. 6, 1960—IUGG: General Assembly, Helsinki, Finland. Inquire: Sec. Gen. G. Laclavere, 30 Avenue Rapp, Paris 7, France.

*Aug. 6-12, 1960—19th INTERNATIONAL GEOGRAPHIC CONGRESS, General Assembly of the IGU and meetings of the IGU Commission, Stockholm, Sweden. Inquire: The International Geographic Congress Postfack Stockholm 6, Sweden.

***Aug. 15 - 25, 1960 — XXI INTERNATIONAL GEOLOGICAL CONGRESS, to be held at the Mineralogical Geological Museum of the University of Copenhagen in Denmark. Field trips before and after the meetings.**

1959 SCHEDULE OF FIELD TRIPS

For additional field trips held in conjunction with meetings, see those items marked with an asterisk under meeting calendar.

April 11—ILLINOIS STATE GEOL. SURV., trip to Metropolis area of Massac & Pope Counties, Illinois.

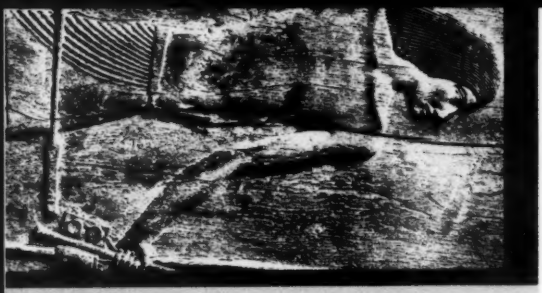
April 25—ILLINOIS STATE ACAD. OF SCIENCE, Field Trip.

May 2—ILLINOIS STATE GEOL. SURV., trip to Hardin area of Calhoun Co., Illinois.

May 16—ILLINOIS STATE GEOL. SURV., trip to Wilmington area of Will, Kankakee & Grundy Counties, Illinois.

GEOLOGIST EDITOR

National organization desires geologist experienced in editorial work, dealing with printers and meeting deadlines. Diversified work. Academic background and PhD desirable, but not essential. Eastern location. Age 28-40. Salary open. Send background details to AGI Box 101.



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The measurement of the age of natural carbon-bearing substances has introduced a new era in archaeology and certain phases of geology. Widespread use of this new tool by field research scientists has become possible through recent advances in low-level counting techniques and equipment. Radiocarbon dating, previously restricted to a few academic laboratories, is now offered as a standard service at a reasonable cost at Isotopes, Inc.

Arrangements for measurement of samples collected during the 1958 field season should be made as soon as possible.

Write for further information and details.

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This Month in GEOTIMES

Professional News Magazine

Published by THE AMERICAN GEOLOGICAL INSTITUTE

Robert C. Stephenson, EDITOR

Kathryn Lohman CIRCULATION MANAGER

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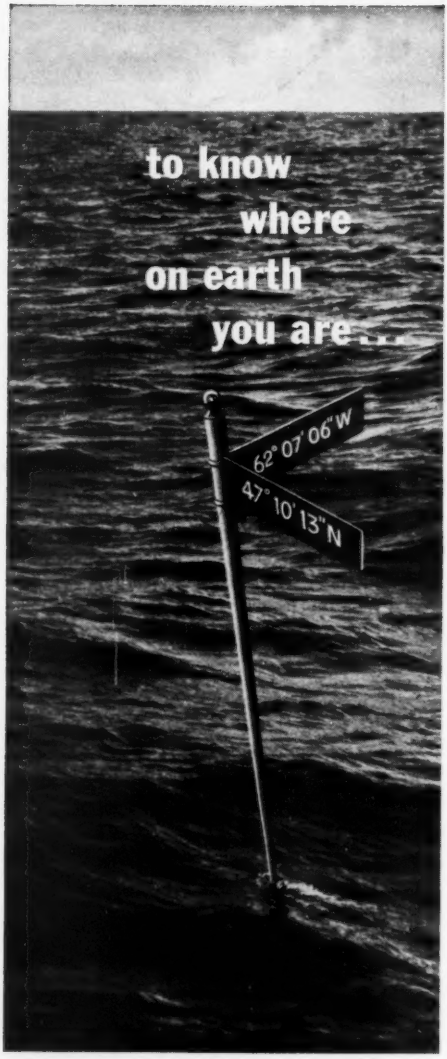

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Spontaneous

Spontaneous—proceeding from, or acting by, internal impulse, energy, or natural law, without external force; self acting. (Webster).

Spontaneous indeed was the action of Bob Karpinski who, of his own volition, has started a new financial drive to aid AGI. Dr. Karpinski, energetic, affable professor of geology at the University of Illinois, was convinced that many a geoscientist would willingly contribute to the support of the Institute if approached on a personal basis. Starting with his own check, made out in the amount of $10 to the AGI Committee of 1000, he worked quietly and unbeknown to AGI to seek other subscribers among his friends.

At the St. Louis meeting in early November, Bob Karpinski presented to the AGI Board of Directors checks amounting to $180 representing the $10 contributions of 18 geologists to the Committee of 1000 for AGI.

Many members of the profession, Karpinski suggested in transmitting these checks to the Board, are willing to shoulder a share of the responsibility for financing of the AGI, but are not sufficiently affluent to pledge membership in the distinguished Committee of One Hundred for AGI. It was Dr. Karpinski's idea to marshal these persons under the Committee of 1000 for AGI and that members of this committee should contribute $10 or more to the Institute. He further pointed out that any individual in the profession could not only join the Committee of 1000, but could also serve to recruit other members from among friends and associates.

It is important to mention that 11 out of the 18 original members of the Committee of 1000 for AGI are college professors . . . men of modest means who have spontaneously given of their limited resources to support an effort in which they believe. This spirit, as well as the additional money, will contribute greatly to the growth and development of the American Geological Institute.

OUR COVER

Seasons Greetings from those of us at AGI who serve you of the geosciences.

The AMERICAN GEOLOGICAL INSTITUTE is a non-profit professional service organization established and managed by the scientific societies in the fields of geology and geophysics in cooperation with the National Academy of Sciences-National Research Council. It is the instrument of the profession serving and advancing the welfare of the geoscientist in matters relating to education, professional responsibilities and government relations. It is an active member of the Scientific Manpower Commission. It also functions in the stimulation of public education and awareness of the earth sciences, through career literature, the scouting program and other channels of communication.

GEOTIMES is the news magazine of the geological sciences. It reports on current events in the earth sciences, public education and public relations efforts throughout the profession, as well as appropriate legislative and governmental issues. It announces scholarships, fellowships, publications and new developments. It provides a forum for discussion of timely professional problems, and affords a common bond between the many specialized groups within the earth sciences.

THE OIL FINDER

by MERRILL W. HAAS [1]

Sometimes a geologist becomes convinced that oil cannot occur in an area and finally says he will drink all the oil found there.

When this happens, he should ask for a transfer. He has been in the area too long. Negative thinking never found a barrel of oil.

A good geologist should critically examine and challenge the statements and theories of others in his own mind. He should follow up with positive actions based on his ideas and sell them to management. By so doing, he will be a creator of fires instead of a fire fighter. It is the creator who has the most to gain and obtains the bulk of the oil reserves.

In the early 1930's pessimists estimated U. S. crude oil reserves at a 15 to 20-year supply. Their periodic warnings have continued during the last 25 years. Eventually they will be correct, but there is strong evidence demand will be met for many years to come.

What has been accomplished during the last 25 years? The industry has provided all needs, including the terrific demands of a World War. Accumulated production has amounted to more than three times the reserves of 25 years ago and remaining proved crude oil reserves have increased more than tenfold.

Many billions of barrels of oil are yet to be found in old densely drilled geologic basins and in the partially drilled basins. In some of the latter, well density averages about one well for each 250 square miles of basin area.

KNOWN BASINS WILL YIELD MORE

In these regions the subsurface control is so poor that the geologic maps are mainly conjecture. When sufficient information becomes available to better delineate the prospective areas for accumulation, these basins will add substantial volumes of oil to the reserve picture. The Williston Basin of North Dakota-Montana and the Paradox Basin in Utah and Colorado are recent examples which are now developing significant reserves.

Many basins throughout the world are in the reconnaissance stage of exploration now. Although some of these basins contain oil seepages, their development will be slow and far into the future. They are cited to stimulate imagination and to support the belief that a 1,000 billion barrel target for free world oil reserves can be achieved by 1975. Present free world reserves are about 295 billion barrels.

Oil is hard to find and it has always been so. It is also expensive to find and the risks are great.

In the new and sparsely drilled basins' photogeology, surface geology and the various seismic tools will still continue to be the most successful exploration methods. In addition, the new mapping techniques, such as ratio and facies maps, are excellent means of delineating prospective areas from regional control. These will provide the guides for the use of more expensive exploration methods such as the core drill and seismograph.

In the densely drilled areas, such as eastern Oklahoma, the Illinois and Michigan basins, detailed subsurface studies will continue to be most effective. Although subsurface studies are inaugurated early in the development of a basin, this powerful exploration tool does not attain its full usefulness until thousands of wells are available to supply the necessary subsurface data.

NEW CONCEPTS AHEAD

New concepts about oil occurrence are certain to develop as more fundamental knowledge is obtained about source beds.

Since the anticlinal theory, many ideas about reservoiring oil have come forth, such as fault traps, salt domes, and stratigraphic traps. Even after the recognition of stratigraphic accumulations, who would be so bold as to state that a particular oil field was a stratigraphic occurrence and that the anticlinal structure was coincident with the stratigraphic trap? There must be accumulations today that are being explained by conventional ideas. When the true conditions are recognized, an entirely

[1]Merrill W. Haas is Vice President of Carter Oil Company. This article, which is reprinted from *The Link*, May-June 1958, was based on a talk which Mr. Haas presented to geologists attending a Carter training session.

new wave of exploration will sweep over the basin areas.

Adhering to the anticlinal theory, what geologist would recommend drilling for oil in a syncline? Yet large accumulations occur in them. Strictly following present ideas about the orgin of oil and source beds, who would drill several hundred feet into basement rock to search for petroleum? It has been done and a sizeable reserve is reservoired there.

Geologists are still "gun shy" at recommending drilling for hydrocarbons on a regional down-dip pinchout where the reservoir and source beds interfinger. The huge gas reserve in the San Juan Basin is an outstanding example of accumulations under these conditions. During the past several years in the United States major additions to reserves have been found by drilling around the edges of old oil fields. This will also happen in other regions. New concepts about oil occurrence will develop through research, imagination and sheer determination to test a theory where others have feared to tread.

Because of progress being made in well log interpretations geologists should examine periodically logs of unsuccessful wildcat wells and apply new interpretational techniques. Results will be astounding. Likewise examine logs in old producing fields. The number of shallower productive reservoirs that were missed during routine drilling operations will be surprising.

"Stratigraphic Era" Only Beginning

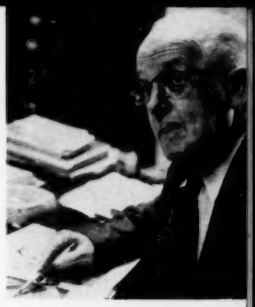
In many areas the stratigraphic era of exploration is only beginning. Because stratigraphic oil is hard to find, it provides the best hunting ground with respect to size and number of fields to be found.

Unfortunately, present exploration methods do not contribute substantially toward finding these accumulations. Deposition of sediments takes place in ascending order, yet oil men drill from the surface down. Few cross-sections exhibit a complete sedimentary section. They generally terminate with the bottom of well control. This has stifled geologic curiosity. It creates shallow thinkers. When imagination is applied to the undrilled section with the same vigor as to the shallower beds, large stratigraphic accumulations will be discovered.

The study of hydrodynamics or fluid pressures is a new approach in petroleum exploration. It is an aid in explaining the reservoiring of oil on the flanks of structure, which is a common occurrence in

(Continued on page 28)

Raymond C. Moore



The profession can justly point with pride to the fact that one of the leading scientific figures in gology, Dr. Raymond C. Moore, has been appointed a Distinguished Professor at the University of Kansas where he has served since 1916. This is the first such appointment to be made at K. U. and it was particularly timely for it came at the close of his term as President of the GSA.

Professor Moore is known for many and varied contributions of significance to geology and the geologic profession. He has won international recognition for his work as organizer and editor of the *Treatise on Invertebrate Paleontology*, the 24-volume work of which 7 volumes have been published. He has been President of the Commission on Stratigraphy of the International Geological Congress since 1952. For many years he was State Geologist of Kansas and Head of the Department of Geology at K. U.

Ray Moore, a man of varied talents, is a gifted artist. He is well-known for his series of sketches of his contemporaries among the State Geologists. His talents as an illustrator are also evident in his textbook, *Introduction to Historical Geology*, which has just appeared in revised form.

In making the nomination, Dr. Franklin D. Murphy, Chancellor of the University of Kansas, commented that Dr. Moore "without question is one of the world's greatest geologists and paleontologists." The professorship was given in the name of Solon E. Summerfield, an alumnus of the University and one of its greatest benefactors.

Guest Lecturer

Dr. Adrian E. Scheidegger, Research Associate of the Imperial Oil Co., Ltd., at Calgary recently was a guest of the Massachusetts Institute of Technology where he presented a two-week lecture series on *"Hydraulic Effects in Geodynamics"* at the Department of Geology and Geophysics.

UNFINISHED BUSINESS BENEATH OUR FEET

by WALTER YOUNGQUIST [1]

The other evening when the final stage of Sputnik III tumbled across the sky over Eugene, Oregon, supermarkets emptied as people crowded out to view the spectacle, and who amongst the crowd did not know that chemists, physicists, and astronomers were the men who accomplished this great feat. Where were the geologists? Well, I was out looking up, too. But maybe we ought to be looking down.

The statement "a bird in the hand is worth two in the bush" is time-tested. Similarly it would seem that we might do well to consider what more can be done with the planet we have already reached, as well as to reach for the moon or for Mars. The Earth is still important, for if we took away the Earth from physicists, chemists, and astronomers, they wouldn't have much on which to stand. Even the alchemists must start with something; they cannot create gold out of nothing. As a geologist, I feel kindly toward the Earth. It has provided man with a good living. How well the Earth has treated man has been chiefly dependent upon how hard man has been willing to work with the Earth. Now we are drilling below 23,000 feet, but the Earth's surface, literally, has hardly been scratched. We have penetrated by means of a hole a few inches in diameter not quite five miles into the Earth, and this has been done in only a few places. What a frontier exists beneath our feet!

In teaching an adult night course in rocks and minerals, I found a great deal of popular interest evidenced in the idea that there is not just one land surface but actually many land surfaces to prospect. With the numerous unconformities within the geologic column, how many potential mines lie "exposed" along a buried land surface somewhere? Geologists have tramped only one surface of the Earth, and the drill has penetrated a few other surfaces in the form of unconformities here and there. Even when we have thoroughly explored our land surfaces, we still will know what occurs on less than one-third of the Earth, for more than two-thirds of the Earth is covered by water. Geological mapping of the ocean basins has barely begun. What would a core drilling program of the Middle Atlantic Ridge reveal? Are mineral resources from that area any less inaccessible than those on the moon or Mars? And why should not such a program be just as challenging to a nation as putting a three-foot ball into orbit? What has limited our efforts to search the Earth more thoroughly? It has been lack of equipment and lack of funds, which in the final analysis is simply a lack of national will to do this. Now, as a nation, we are proposing to throw our energies and resources to the moon and to outer space. Granted that this cause has great military implications, the outcome of which may well determine our ability to preserve our way of life, it seems worthwhile to point out also that our survival depends upon finding resources on this Earth.

It has been suggested by some newspaper writers that we might eventually send rocket ships to the moon and to other planets, and from these places bring back ore, oil, etc. to supply our needs. The economics of this project seem quite impossible to me during our generation and perhaps for many more to come. How much more available are the resources which lie undiscovered beneath our feet! As geologists, we would be doing the public a great service to point out how little is known about the Earth on which we live and what might be done here and now. If the United

[1] Dr. Walter Youngquist is on the faculty of the Geology Department at the University of Oregon. He also engages in a consulting practice.

States and Russia could be induced to engage in another contest, not to see how much energy and material can be flung into space, but to try to go deeper into the Earth, who knows what might be found for the benefit of all mankind. A recent article by T. G. N. Haldane in *The New Scientist* (May 1, 1958) entitled *"Geothermal heat: the Earth as a power-station boiler"* suggests that we might have a source of almost inexhaustible energy in the form of the Earth's heat. If we could use the Earth as a whole as an energy source, think what it would mean in terms of each country being able to develop its own energy supplies. The unequal geographic distribution of energy in the form of oil is today causing the world a great deal of trouble. Could it be that geologists will be prospecting for Earth boiler sites around the world one of these days and by this effort ultimately contribute toward world peace?

Haldane *(op. cit.)* also states that "Our knowledge of the internal structure of the Earth is extremely limited; in fact, we probably know more about the interior of the Sun than we do about the interior of the Earth." A good look into the Earth's interior may be a lot more profitable than a look at the other side of the moon. In regard to the moon, by the way, I will give even money that the other side looks just about like this side. Any physicists or astronomers want to bet?

What I attempt to say here has been aptly summed up by Dr. Paul F. Sears in his AAAS presidential address of December, 1957, and printed January 3, 1958 in *Science:*

> *"I have no quarrel with the exploration of outer space. It is a legitimate and challenging subject for scientific inquiry and bold experiment. Our optical and mathematical studies of it have long since given us that basic confidence in order without which there could be no science. But, as we extend our astronomy by whatever celestial acrobatics we can get away with, I should like to see some consideration given to relative values. We have a vast amount of unfinished business at our feet."*

As geologists, let's write to and talk with our government representatives. Let's talk to audiences wherever and whenever we can. I am convinced we have as much, if not more, to offer man for his future well being as does any scientific group. Let man look both up and down. We have much unfinished business beneath our feet.

Sir Harold Jeffreys

Sir Harold Jeffreys of Cambridge University will be a Distinguished Visiting Lecturer at the University of Minnesota during the spring quarter, 1959. He will present a series of lectures on *"Elasticity and its Geophysical Applications,"* with special reference to recent work in related fields such as rock flow. The series, extending from April 1 to June 15, will be sponsored by the Geophysics division of the School of Mines and Metallurgy, and the Department of Mechanics and Materials.

Professor Jeffreys is well known to persons in the geological sciences as one of the most distinguished mathematical geophysicists of our time. The fields in which he has made important contributions include earthquake seismology, astronomy, dynamic geology, mathematics, and mathematical physics. He is perhaps best known to geologists for his book, *"The Earth,"* now in its third edition, and to physicists for *"Methods in Mathematical Physics,"* written with Mrs. Jeffreys. The honors he has received include among others, award of the William Bowie Medal by the American Geophysical Union in 1952 and election to Foreign Associate in the National Academy of Sciences.

During Professor Jeffreys' visit, Professor Harold M. Mooney will be visiting lecturer in the Institut für Geophysik, Eidg. Technische Hochschule, Zurich, Switzerland, under a grant from the American-Swiss Foundation for Scientific Exchange. Professor Mooney is Associate Professor of Geophysics at the University of Minnesota.

Geodesists Needed

The Civil Service Commission has announced an examination for Geodesists grades GS-5 to GS-15 at entrance salaries of $4,040 to $12,770. Vacancies exist in a number of different government agencies. There is no closing date. Persons desiring more details may request *Announcement No. 168B from the U. S. Civil Service Commission.*

Missouri Earthquake Leaves

GEOLOGISTS UNSHAKEN

Old Mother Earth shook in defiance at geologist Raymond C. Moore, who dared to talk about the stability of her crust. Dr. Moore's address *Stability of the Earth's Crust* presented as retiring president of the Geological Society of America at the annual meeting in St. Louis on November 6 touched off violent tremors in Japan. The following night, as the geologists gathered for the annual banquet, there were window-rattling tremors felt throughout St. Louis and adjacent areas, but the geoscientists talked on, oblivious of the geologic performance.

The St. Louis University seismograph reported the first shock at 8:41 p.m. and continued to record vibrations for the ensuing fourteen minutes. Dr. Ross R. Heinrich of the Department of Geophysics reported the quake to be centered in the area of the junction of the Ohio and Wabash Rivers where three fault zones intersect.

At the St. Louis meeting of the GSA approximately 2000 geoscientists gathered for the three-day meeting. Meeting with the Geological Society of America were the Association of Geology Teachers, Society of Economic Geologists, Mineralogical Society of America, Geochemical Society, and the Paleontological Society.

There were nearly 300 papers presented on a wide range of subjects. One of the highlights of the meeting was the Symposium on Fifty Years of American Paleontology commemorating the Jubilee Meeting of the Paleontological Society. Participating in the symposium were Norman D. Newell, *The Fossil Record*; C. O. Dunbar, *A Half Century of Invertebrate Paleontology*; A. S. Romer, *Vertebrate Paleontology*; Theodor Just, *Paleobotany, 1908-1958*; Henry V. Howe, *Fifty Years of Micropaleontology*; and Preston E. Cloud, *Paleoecology*.

The Association of Geology Teachers sponsored a *Symposium on Communication in Geology* which featured seven papers on various subjects. As an outgrowth of this session, the AGT adopted a resolution, which was subsequently presented to the Board of Directors of the American Geological Institute, calling upon the AGI to move to resolve problems of geologic terminology.

The St. Louis meeting was attended by three Russian geoscientists. D. S. Korzinskii, internationally known geochemist and one of the three Russian scientists, met with Dr. Earl Ingerson, Translations Editor of the Geochemical Society, to discuss the English translation of Korzinskii's book *Physicochemical Basis of the Analysis of Paragenesis of Minerals* soon to be published by the Society. Also present at the meeting was V. V. Belousov, prominent Russian geologist and member of the Academy of Sciences of the U.S.S.R. The AGI has a translation of Dr. Belousov's *Fundamental Problems in Tectonics* under way. In conferences with Dr. Rhodes W. Fairbridge, Director of the AGI Translation Center, Dr. Belousov agreed to provide original illustrations of his book and to review the translated copy before publication. The third Russian scientist was Vladimir Vlassov.

The publicity for the meeting was handled very effectively under the guidance of Dr. Arthur B. Cleaves, well-known engineering geologist. With a lot of personal effort and a very modest budget, the publicity committee did an outstanding job. Local press representatives commented that they had never experienced a better flow of pre-meeting publicity.

A measure of the effectiveness is shown by the following quotation from a letter received from Fulbright Professor Elroy P. Lehmann in Karachi, Pakistan, *"It is GSA weekend and I was surprised to see the paper carry a short wire service story of R. C. Moore's presidential address datelined St. Louis."*

The meeting was covered by radio and TV as well as the newspapers. Bob Legget, Art Cleaves and George Kiersch were on KETC, the educational TV channel, and the latter two appeared on the Eye on St. Louis TV program to discuss landslides and other engineering geology subjects. The station received many phone calls commenting favorably on the program.

Is there a fjord in your future?

May we be permitted to paraphrase a well known slogan, *"Is there a fjord in your future?"* We will hazard the guess that if your wife has been heard humming *"Wonderful, Wonderful Copenhagen"* as she goes about her household chores there may well be a "fjord in your future," but you have not yet realized it. She has probably read that the five Nordic countries—Denmark, Norway, Sweden, Finland, and Iceland—are to be hosts to the XXIst International Geological Congress in Copenhagen August 15-25, 1960.

For many geologists 1960 will be that occasion for a combined business-pleasure trip to Scandinavia and the rest of Europe with built-in tax advantages. It will be a family affair for many inasmuch as wives and kids will be accompanying many husbands. The Congress will provide the incentive for many families to point toward this trip in 1960.

The First Circular announcing the XXIst International Geological Congress was issued in June 1958 and may still be obtained by writing the American Geological Institute. This circular lists 48 pre-Congress excursions to Scandinavian countries including Greenland and Iceland. After the Congress 43 excursions are to be scheduled.

Preliminary returns received by the Organizing Committee indicate that the Copenhagen Congress will be well attended and that there is great interest in all of the field excursions planned. Persons who have not yet secured the First Circular and returned the enclosed forms should do so at once in order that they may be tentatively registered on the excursions of their choice.

The field excursions will offer a wide fare of geology from stratigraphy and structure to geomorphology, petrology, and economic geology. Papers will be received for presentation under 20 different subject sections and abstracts must be submitted to the Congress General Secretary before April 1, 1959. The First Circular gives details on the papers.

Meeting with the International Geological Congress will be the International Paleontological Union and the Association of Sedimentary Petrologists. The International Geographical Union will meet in Stockholm, Sweden, August 6-12, prior to the Congress.

The EUROPEAN TRAVELING SEMINAR, 2475 Virginia Ave., N.W., Washington, D. C., has been designated by the Congress Organizing Committee as the Official Agent for North America. ETS, specializing in personalized travel service to educational groups, is staffed by Danish people who are thoroughly familiar with travel in all European countries. It is well-supported by close cooperative arrangements with a widespread network of European travel agencies. Mr. John Hansen, one of the travel managers for European Traveling Seminar, has attended five major regional and national geological meetings in the U. S. this fall to answer questions concerning the International Geological Congress and to provide preliminary travel information. Mr. Hansen will be available during the winter months ahead to meet with the larger geological societies to give a short talk on Congress travel possibilities.

ETS is considering the possibilities for extension of geological excursions to other parts of Europe and is prepared to tailor sightseeing plans for individuals and groups of individuals into their Geological Congress plans. These plans could include a fjord in your future, either by way of a Congress geology field excursion to Norway or a personal tour arranged in the pre- or post-Congress periods.

XXIst INTERNATIONAL GEOLOGICAL CONGRESS

Nordic Countries
August 1960

You may obtain the First Circular for the 21st IGC and be placed on the mailing list for travel literature and plans by writing **CONGRESS TRAVEL, c/o American Geological Institute, 2101 Constitution Ave., N.W., Washington 25, D. C.**

AAPG RESEARCH GRANTS-IN-AID

Closing Date January 16, 1959

The Research Committee of the American Association of Petroleum Geologists is prepared to receive applications for grants-in-aid of research. The closing date for receipt of applications by the chairman of the Screening Subcommittee on grants-in aid is January 16, 1959. Qualified persons working on projects approved by the Committee, who are not A.A.P.G. members, are eligible for grants, as well as the Society membership. Awards will be announced at the Annual Meeting of the American Association of Petroleum Geologists March 16-19, 1959.

Applications should be supported by letters of recommendation by professors or qualified persons familiar with the applicant's ability in research. Supporting letters should be sent under separate cover to reach the chairman of the Screening Subcommittee by the closing date.

Additional information on the A.A.P.G. Research Grants should be addressed to R. W. Landes, Chairman, Screening Subcommittee, Jersey Production Research Co., 1133 North Lewis Ave., Tulsa 10, Okla.

NSF Accepting Research Proposals

The Earth Sciences Program of the National Science Foundation is now receiving proposals for research grants that will be made in June and July 1959. Deadline for the receipt of proposals for work to begin in the summer is January 15, 1959. There are no formal application blanks, but a Foundation pamphlet describes the method of making application and outlines information needed in a proposal. This pamphlet may be obtained by writing directly to the NATIONAL SCIENCE FOUNDATION, *Washington 25, D. C., Attention: Earth Science Program.*

You saw it in GeoTimes . . .

PLANET EARTH is a new teaching aid series produced by the IGY National Committee. It consists of six large, beautiful, full-color wall posters, a 44-page Student Brochure and Teacher's Kit available as a low cost package from *IGY, 2101 Constitution Avenue, Washington 25, D. C.*

A Helping Hand?

Geological literature of all kinds, but especially U. S. geological and geophysics journals are direly needed by the Department of Geology, University of Karachi, Karachi, West Pakistan. Professor Elroy P. Lehmann, formerly of Wesleyan University, makes this plea from the University of Karachi where he is now a Fulbright professor. He points out that libraries in the geology departments of the universities of the underdeveloped countries such as Pakistan are woefully deficient, making it difficult to build up the geologic training essential to natural resource development programs in these countries. Gifts of books and journals to libraries in these countries will create much goodwill.

Persons who can supply sets of U. S. geology-geophysics journals and texts are urged to contact Dr. Lehmann at the University of Karachi.

NSF Post Doctoral Award

The National Science Foundation recently announced the award of 34 fellowships for advanced study and research through its Postdoctoral Fellowship Program.

One award of the 34 was made in the field of geology. This went to Dr. Jane Gray of the University of Texas who will study at the University of California, Berkeley.

The NSF is now accepting applications for pre- and post-doctoral awards to be made in March 1959.

Iraqi Geologist at New Mexico Tech

Dr. Mahdi Salih Hantush, who is on loan to New Mexico Institute of Mining and Technology at Socorro, New Mexico, by the Iraqi government, will direct a ground-water research program at the New Mexico institute. Much of his work will be devoted to the development of induced-electrical-polarization equipment and its use in field exploration. He will teach geophysics and will specialize in ground-water hydrology. Dr. Hantush, who holds a doctorate degree from the University of Utah, recently served as dean of the College of Engineering at the University of Baghdad.

PETROLEUM GEOLOGY NEEDS RESEARCH

by J. BEN CARSEY[1]
Chairman AAPG Research Committee

Current issues of the *GeoTimes* and the *AAPG Bulletin* carry announcements that the Research Committee of the AAPG again is prepared to receive applications for research grants-in-aid. The AAPG Research Fund from which these grants are being made is of very modest size of around $50,000 and has been built up principally from small contributions. If this fund is to be maintained so that grants-in-aid can be awarded in future years, it of course must be regularly augmented; recently, however, there has been a noticeable decline in contributions. In view of this, a brief review of what is being accomplished through the use of the Fund seems highly desirable in order that the profession may have a fuller appreciation of the work being done and will better understand the importance of making contributions.

For the 1958-1959 Association year, the Executive Committee of the AAPG authorized the granting of $10,000 from the Research Fund in support of research projects. An invitation to submit proposals for work in which these funds could be used was announced in April through the *GeoTimes*, the *AAPG Bulletin*, and the geology departments in American universities listed by the AGI. As a result, 25 applications were received, which collectively covered requests totaling $22,000. An exhaustive, objective screening of these applications was made, first by a Screening Subcommittee and then by the entire Research Committee membership of 22 persons. In order to support as many worthwhile projects as possible with the limited funds available, the amounts requested were scaled down in every instance. Some 12 grants finally were awarded in the amount of $5,272; collectively, these 12 applicants had requested a total of $12,000. Since it was planned to make two grantings for the year, approximately one-half of the authorized budget has been reserved for the second award, for which the current request for applications has been made.

MORE APPLICATIONS THAN MONEY

It is gratifying that the Committee is now receiving many applications of superior quality, but it is disappointing that, because of limited funds, only a few of the requests can be supported. Additional worthwhile projects could have been financed at least in part had more money been available. As it was, in the grants which were made, various economies had to be applied, such as following the general policy of not approving salaries for the principal researcher or his assistants.

It should be noted that in awarding grants-in-aid, the Research Committee is attempting to assist graduate students, instructors, and professors who are not professional research people and who would not otherwise receive support for their work. This is particularly true in cases where the applicant is associated with a small college. Another effect which is apparent is that where at least a part of a request is granted, the recipient is encouraged to go ahead with his research while attempting to secure additional support from other sources.

Because of the importance of the grants-in-aid, a subcommittee within the Research Committee has been established, and Dr. R. W. Landes of Tulsa has accepted the chairmanship. With this arrangement, it is contemplated that additional attention and time can be devoted to the proper processing of the applications and the handling of the funds.

The Research Committee is now formulating plans for an evaluation of the projects which have been completed with help from the Research Fund. Mr. Frank R. Clark of Tulsa, Oklahoma, former President of the AAPG, has very graciously agreed to make this study and members of the Research Committee will be available to assist him if this is required. One principal objective of this study will be to prepare a statement or summary of the accomplishments resulting from the grants which can be published in the *AAPG Bulletin*.

BASEMENT ROCKS PROJECT

Perhaps the largest single project being sponsored by the Research Fund is that on Basement Rocks. This work is being conducted through a subcommittee which is headed by Dr. Peter T. Flawn. The reader will recall that Dr. Flawn, who is associated with the University of Texas

[1]J. Ben Carsey, Humble Oil & Refining Co., P. O. Box 2180, Houston 1, Texas.

AAPG Research—*Continued from page 13*

Bureau of Economic Geology, is the author of the comprehensive report, "Basement Rocks of Texas and Southeast New Mexico." The support of the Grants-in-aid Fund is enabling Dr. Flawn to expand this work to cover all of the United States, Canada, and northern Mexico. Dr. Flawn is co-ordinating the information through a subcommittee composed of 13 specialists representing all parts of the region. The results of their work are to be published as a map accompanied by a text containing tabulated well data.

The Research Fund was created in the 1920's but received its principal impetus during the presidency of Mr. G. M. Knebel in 1955-1956. On September 1, 1955, legal steps were taken to establish it as a non-profit trust. Funds were solicited from the members in October of 1955, and Mr. Knebel set a goal of $100,000. By March 1, 1958, the Fund had passed the halfway mark. For the larger contributors, a "$1,000 Club" has been established, and by January of 1957 there were seven members of this group with promises of more. It will be recalled that Mr. Knebel prepared a pamphlet entitled, *"The Role of the American Association of Petroleum Geologists in Research"* in February of 1956, urging the support of the Research Fund. He also wrote a memorandum which was published in the January 1957 issue of *GeoTimes*, calling attention to the Fund and recommending participation in it by members of the Association.

Approximately twenty percent of the total Research Fund has been allocated to Grants-in-aid in the past. If this use of the Fund is to continue, contributions also must continue. Large donations are, of course, highly desirable; however, it is hoped that many small contributions will be forthcoming. In view of the very large membership of the Association, if a majority of the members each year were to send in a small sum, this alone would make a sizable addition to the Fund. In the past the various geological societies have contributed significantly, and continuation of this policy will be very helpful. Contributions from both of these sources will broaden interests in the Fund, placing its needs and benefits before a more widely spread audience and arousing more personal interest on the part of the individual geologist throughout the country. It should be remembered, of course, that these contributions to the Research Fund can be used as deductions in computing income tax.

Geology for Puerto Rico Science Teachers

The first National Science Foundation Summer Institute in Earth Sciences to be held in Puerto Rico was given at the Rio Piedras campus of the University of Puerto Rico during the six weeks beginning June 9, 1958.

The Institute was directed by Dr. D. C. McDowell, Director of the University's Institute of Tropical Meteorology. Since there is no geology department at the Rio Piedras campus, Dr. John Weaver, of the Mayaguez campus, was invited to assist with the geological part of the course.

The curriculum consisted approximately of one half meteorology and some oceanography and one half geology. Thirty-six high school science teachers from schools in the island attended the course, the majority of them women.

As far as the geological part of the course was concerned, since none of the teachers had any background in the subject, the lectures were designed as a survey of the whole field of geology with the object of stressing three main aspects: 1. A brief survey of the geology of Puerto Rico. 2. The economic importance of geological work and the need for interesting suitable students in the field. 3. Some of the fundamental problems of geology with emphasis on the importance of the Caribbean region in this respect. The educational value of geology was stressed particularly.

Dr. Weaver gave one week of lectures in the course and Mr. Pease of the USGS team in Puerto Rico gave a talk on the work that the USGS is doing. Mr. Mort Turner, chief geologist of the Economic Development Administration, also gave a lecture on the geological work being done in the island with special emphasis on economic aspects. Two half-day field trips were also held.

The students were extremely enthusiastic and gave every evidence of enjoying the course and of deriving considerable benefit from it. It is to be sincerely hoped that this Institute will be repeated in future years. The Earth Sciences in general and geology in particular have not received sufficient emphasis in the island's educational system in the past and it is very desirable that the eyes of the rising generations be opened to the important potentialities in the field. One way to approach them is through their teachers.

Ge 150 at Cal Tech

Some six years ago the Division of the Geological Sciences of the California Institute of Technology instituted a new graduate level course, Nature and Evolution of the Earth ("Ge 150," as it has become familiarly known in the code of the academic catalog).

Into this course the faculty of the Division and particularly those guest lecturers the Division has been fortunate in attracting into the program, have "put everything they had"—focusing particularly on the frontiers of knowledge in each of the lecturers' fields of special interest. In one term the chief focus of interest may be in geophysics; in another term in paleoecology; in another, cosmology; in still another glaciology; etc.

In the current term two distinguished visiting professors on the Division staff, Dr. C. E. Tilley of Cambridge University, England, and Dr. Hatten Yoder of the Carnegie Institute of Washington's Geophysical Laboratory, are handling the bulk of the lectures and the work of the term is largely centered on new developments in mineralogy and petrology. Dr. Tilley is well known for his contributions to the facies concept in metamorphism; to our knowledge of the differences in oceanic and continental basalts, to the genesis of alkaline rocks—to mention only a few. Dr. Yoder, recently elected to the National Academy of Sciences, has contributed greatly to our understanding of the stability conditions of many important minerals, such as diopside and anorthite, the micas and the garnets, and to the role of water in metamorphism. Both Dr. Tilley and Dr. Yoder will be in residence for the entire fall term of the academic year.

You saw it in GeoTimes . . .

OMNITAPE is a new seismic magnetic media transcriber designed specifically for standardizing all types of magnetic tapes and discs now in use in seismic recordings. The instrument permits transcription of seismic data from any tape or disc record to any other type of tape or disc without loss of record fidelity. For information write *Hale Instruments, Inc., P.O. Box 7487, Houston, Texas.*

Popular Geology in Print

by Mark W. Pangborn, Jr.

Just the thing for older high school students and beginning adults is *George Letchworth English's* GETTING ACQUAINTED WITH MINERALS, thoroughly revised by *David E. Jensen* (McGraw-Hill, 1958, $6.95). This fine book discusses mineral collecting as a hobby, describes over 200 minerals, explains how minerals occur in rocks, and provides recognition tables; blowpipe technique is omitted. Richly illustrated in black and white; no bibliography.

The beginning amateur lapidary will welcome the (little changed) second edition of *Richard M. Pearl's* POPULAR GEMOLOGY (Sage Books, 2679 S. York, Denver 10, Colo., 1958, $4), which reviews the general properties of gems and then describes some 50 important ones. Advanced hobbyists will want *G. F. Herbert Smith's* GEMSTONES (Pitman, 13th ed., 1958, $12.50), freshly revised by F. C. Phillips, a detailed reference book with an extensive bibliography.

Rockhounds will enjoy *Arthur L. Flagg's* MINERALOGICAL JOURNEYS IN ARIZONA (F. H. Bitner Co., Box 1025, Scottsdale, Ariz., 1958, $4.85), a pleasant mixture of early Arizona history, mining lore, and data on collecting areas. GEM TRAILS OF TEXAS, by *Bessie W. Simpson* (Gem Trails, Box 537, Granbury, Tex., 1958, $2.50), briefly describes, with maps, 45 places in which to collect minerals, fossils, and artifacts.

Botanist *Betty Flanders Thomson* has turned out a charming and informative history of the New England landscape in her THE CHANGING FACE OF NEW ENGLAND (Macmillan, 1958, $3.75); after summarizing the geological history of her area, Miss Thomson depicts the postglacial clothing of the land with forest and and meadow, then tells how man has modified the vegetation; unfortunately, there is no bibliography. We cannot but feel, however, that this book, good as it is, would be even better if it had made use of landform maps and similar graphic means to really visualize the geographical relationships so tantalizingly suggested in the text. This volume, like another recent regional book, LANDSCAPES OF ALASKA, reflects the unimaginative approach that most scholarly authors and editors have towards the problem of popularizing their science.

MANPOWER *in a column —*

By HOWARD A. MEYERHOFF
Scientific Manpower Commission
1507 M Street, N.W., Washington 5, D. C.

The Army's Scientific and Professional Personnel Program has offered lean pickings for geologists and geophysicists, despite the fact that the Army operates on the terrain that is the province of the earth scientist. To put the situation in its worst light, there are only 18 slots for geologists as such in a force of approximately 900,000 men. Because of the small number of openings available, the master's degree or its equivalent is the minimum qualification for S&PP rating. Geologists can qualify for additional slots that are open to scientists in other fields.

In a cooperative effort to make more extended use of geologists in uniform, eleven representatives of the Department of the Army and six members of the profession conferred at the Pentagon on October 28. Chairman of the meeting was Col. Carl S. Brandner, of the Office of the Adjutant General. Brig. Gen. Bruce Easley, Maj. Gen. Robert W. Porter, and Mr. Frederick M. Warren, who represented the Assistant Secretary of the Army for Manpower, Personnel, and Reserve Forces, were among the military participants.

A thorough exposition of the *status quo* was presented by Army personnel to the geological delegation. The latter consisted of Finn E. Bronner, of General Electric's Defense Electronics Division; Bennett F. Buie, of Florida State University; Paul Price, of the West Virginia Geological Survey; Robert C. Stephenson, of AGI; Frank C. Whitmore, Jr., of the USGS; and Howard A. Meyerhoff.

The Army did its homework in advance of the conference, and the product is a booklet containing a Replacement Flow Chart, Classification Battery, Reporting System, Job Descriptions (MOS) for Geologists, and a set of Utilization Directives.

The geologists took their homework away with them. They will respond to the invitation to propose expansion and revision of the geological classification. Proposals are to be in preliminary draft by December 15. Final copy should reach the Adjutant General's Office early in 1959.

What reception the proposals will get cannot be predicted. If it matches, or even approaches the excellent reception given the AGI-SMC delegation on October 28, geologists may anticipate a more diversified program of utilization when they are in uniform. And the profession should know that Army officials are seriously concerned about the best possible manpower utilization consonant with military requirements.

GeoTimes Circulation To Be Restricted

This issue of GeoTimes will go to more than 34,500 geoscientist readers, but a number of these readers will be dropped from the mailing list before the January-February 1959 issue as a program to consolidate the mailing list is completed.

The distribution of GeoTimes has grown from 16,000 when the magazine was first issued in July 1956 to more than 34,000 since the completion of the unduplicated master mailing list (GeoTimes, May 1958) including all members of our Member Societies, AIME and AGU excepted.

GeoTimes lives precariously, for it depends on advertising income and voluntary individual contributions for its financial support. When GeoTimes was started in 1956 the AGI Board of Directors, representing the fourteen Member Societies, ruled that society contributions were to be used for general operations and were not to be diverted to support of GeoTimes. The Board also ruled that GeoTimes should be sent to all members of the AGI Member Societies. Caught in the financial squeeze resulting from the increase in printing costs and a skyrocketing circulation, economy measures have been necessary.

GeoTimes has been cut from 12 to 8 issues per year and a program has been under way to restrict its circulation.

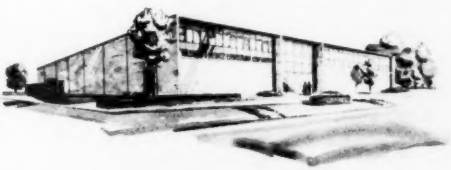
GeoTimes has been going to 5,835 AIME and AGU members who hold membership in no other AGI Member Society. Since these societies, due to the diverse interests of their membership, have been unable to provide an adequate level of support to AGI, these members have been notified that they must subscribe to GeoTimes, join an AGI Member Society providing more adequately for AGI, or be dropped. Recent graduates and other nonmember readers were similarly given notice. First notice of this action was given in September and a final notice is being mailed to readers thus affected with this issue. It is contemplated that the GeoTimes circulation will level off at about 28,000.

Pictured above are faculty members from the University of New Mexico who are organizing the field trip through the Sandia Mountains east of Albuquerque when the AAPG's Rocky Mountain Section meets in New Mexico February 1-4, 1959. In the picture are (seated) J. P. Fitzsimmons, V. C. Kelley, and Ernest Szabo; (standing) R. Y. Anderson and W. E. Elston.

Theme of the February meeting, which will be held in Albuquerque's new multi-million dollar civic auditorium, is to be *"Sedimentary Controls for Future Oil and Gas Discoveries in the Rocky Mountains."* The three-day technical program will feature 30 new papers on the cource, migration and accumulation of oil in all parts of the Rocky Mountain area from New Mexico to Canada.

LUCILLE BERLIN, Supervisor of Science for Tulsa Public Schools, looks over some of the books on Geology and related subjects that have been presented to Thomas A. Edison and Will Rogers High Schools by the Tulsa Geological Society. At the left is Dr. August Goldstein, Jr., Bell Oil & Gas Company, current president of the Society, and Dr. Parke A. Dickey, now with Creole Petroleum Corporation at Maracaibo, Venezuela, who was president when the books were purchased. At the right is P. E. Fitzgerald, Dowell, chairman of the Tulsa Geological Society, Public Information Committee. Other members of the Tulsa Geological Society Committee are Dr. Daniel A. Busch, Consulting Geologist and Roland Hodder, Pan American Petroleum Corporation.

WILLIAMS & HEINTZ MOVES TO NEW PLANT



Williams & Heintz Lithograph Corporation, printers of GeoTimes and specialists in printing of geologic maps, have moved to a new plant at 8351 Central Avenue in suburban Washington.

The new building is of tri-level design and provides 27,000 square feet of floor space. A glassed-in control room on the upper level overlooks the mechanical and technical departments, permitting visual control of all operations. All units of the plant are air-conditioned to provide maximum quality control. The press room contains the latest multicolor presses for jobs both large and small. The building and equipment represent an investment of one-half million dollars.

The company was founded in 1927 and has grown from a small firm with less than 10 employees to an organization which today numbers 65 persons.

Williams & Heintz have become widely known as specialists in the printing of topographic and geologic maps. William W. Heintz, president of the company, is one of the leading specialists on lithography in the country. He has directed much attention to development and improvement of techniques in the compilation and production of geologic maps.

Currently under way in the Williams & Heintz plant is the preparation of a series of topographic maps covering the island of Cuba. Geologic maps are in progress for Indiana, Pennsylvania, Nevada, and West Virginia, as well as for the Geological Society of America. The company also produces magazines, journals, public relations brochures and other types of lithography.

GEOLOGY in the Public Eye

by Robert L. Bates

From June 29 to Sept. 21, station KGW-TV in Portland, Oregon, carried 13 half-hour programs on northwestern geology, by John E. Allen of Portland State College. Request for the series came from the station, after a couple of successful single programs. Oregon's General Extension Division agreed to offer the series as a credit course, and to provide modest payment to Dr. Allen for his summer's time. Thirty people completed the course, each paying $27 for 3 hours' credit. In addition, some 10-12,000 people in the Portland area were regular watchers, in spite of the awkward telecast time of 12:30 to 1 on Sundays.

Registrants had regular assignments in a specially prepared 38-page *Viewer's Guide*, priced at $1.00, and also in R. M. Field's *"Geology"* (College Outline Series). Each week's written work came to 2 to 6 typed pages per person; it took about 3 days per week to grade them. Another 3 days were spent in preparing the lectures.

About 4 charts were used per session, and an average of 30 photos. Maps and specimens were also in evidence. The camera was on the lecturer only briefly. A neat trick was to write notes and diagrams on the charts in pale blue non-photographic pencil, and fill them in with broad pen during the talks. Dr. Allen says this "gave an impression of extreme erudition and artistic ability."

The entire series was taped, and was presented a week later over KING-TV in Seattle. (Both this station and KGW-TV donated the time for the series.) The programs were also filmed, and the film of about 6 hours will be available from the General Extension Division for use on a rental basis.

Although the series was not a money maker for anyone concerned, both the TV station and the education people are impressed with the resulting publicity and goodwill. (Two other courses are now being planned, on non-geological subjects.) Unsolicited letters of appreciation, and a sale of more than 500 Viewer's Guides, plainly showed a large potential "market" for well-presented programs of this type. What better subject than geology to show the way?

HISTORY OF GEOLOGY

Featured by Section E
At AAAS Meeting
Dec. 26-30

History of American Geology will be the feature symposium of the program of Section E, Geology and Geography, of the American Association for the Advancement of Science at the annual meeting in Washington, D. C., December 26-30. The symposium has been arranged by Edgar W. Owen, University of Texas, noted geological historian and former president of the American Association of Petroleum Geologists.

The symposium will consist of the following papers:

Science in America before 1830, by Dirk Struik, MIT.
The Earliest Geologic Maps of the United States, by John W. Wells, Cornell Univ.
Emergence of Geology as a Public Function, by William Back, U.S.G.S.
The Role of the Smithsonian Institution in Early American Geology, by Paul H. Oehser, Smithsonian Inst.
The U. S. Geological Survey and the Advancement of Geology in the Public Service, by Thomas B. Nolan, U.S.G.S.
Geology, Geologists, and the A.A.A.S., by Kirtley F. Mather, Harvard Univ.
Geology Plus Adventure: The Story of the Hayden Survey, by J. V. Howell, Tulsa, Okla.
History of Popularization of Geology in America, by Mark W. Pangborn, U.S.G.S.
A University Course in History of Geology for Seniors and Graduates, by F. C. MacKnight, Univ. of Pitt.
Asa Gray and American Geology, by A. Hunter Duphee, Univ. of California.
Darwinian Natural Selection and Vertebrate Paleontology, by John A. Wilson, Univ. of Texas.
Dr. John Evans, U. S. Geologist to the Oregon and Washington Territories, by Erwin F. Lange, Portland State College.
Highlights in the History of the Development and Use of Topographic Maps as a Base for Delineating Geological Information by Agencies of the Federal Government, 1800-1879, by Herman R. Friis, National Archives.
Impact of the Development of Photogrammetry on Geology, by David Landen, U.S.G.S.
Development of Geologic Thought Concerning Ulster County, New York, by Jules D. Friedman, U.S.G.S.
David Dale Owen: Some Aspects of His Personal and Professional Life, by Kenneth Dale Owen, Houston, Texas.
Remarks on the History of American Petroleum Geology, by Edgar W. Owen, Univ. of Texas

The AAAS meeting will also feature other sessions on geology and geography including a second symposium on *Experimental Geology*. Robert R. Shrock of MIT, as Retiring Vice President of the AAAS for Section E, will give an address *"Primary Structures in Sedimentary Rocks."* Frank B. Whitmore, head of the Military Geology Branch, U. S. Geological Survey, is Secretary of Section E.

This data sheet when cut out and punched will fit a handy pocket-size notebook available from almost any stationery store. There are many and varied data sheets available commercially in this size. If you have ideas for helpful data sheets write to Dr. R. M. Foose, Stanford Research Institute, Menlo Park, California, Chairman AGI Data Sheet Committee.

AGI 9

Summary of Geophysical Data

Prepared by the A.G.I. Data Sheet Committee

DIMENSIONS AND MASS PROPERTIES OF THE EARTH[1,2]

Equatorial radius.....6,378 km	Area of lands.....148.9 X 10^6 km^2
Polar radius.....6,357 km	Area of oceans.....361.2 X 10^6 km^2
Radius of sphere with earth's volume.....6,371 km	Average height of lands..... 470 m
Average density.....5.517 g/cm^3	Average depth of oceans.....3,795 m
Mass (M).....5.98 X 10^{27} g	Average elevation of earth's surface (solid), compared to sea level.....-2,430 m
Moment of inertia.....1/3 MR^2	Theoretical gravity at poles.....983.221 cm/sec^2
Theoretical gravity at equator.....978.049 cm/sec^2	

DIMENSIONS AND PROPERTIES OF INTERNAL LAYERS OF THE EARTH[3,4,5,6]

Layer	Depth to boundaries (km)	Fraction of volume	Mass (in 10^{27} g)	Density (g/cm^3)	Compressional velocity (km/sec)	Shear velocity (km/sec)
Continental Crust	0-33	0.0155	0.05	2.67 - 3.07 (2.84 av)	5.9 - 7.4?	3.54 - 4.1?
Mantle	33-2,900	0.8225	4.05	3.32 - 5.66 (4.93 av)	7.75-13.64	4.35 - 7.30
Core	2,900-6,371	0.1720	1.88	9.7 -12.37 (10.93 av)	8.10-11.31	---

DIMENSIONS OF COMPONENTS OF THE EARTH'S CRUST[7,8]

Region	Area (in 10^6 km^2)	Av. surface elevation (km)	Depth below sea level to boundary (km)	Sediments Volume, solid (in 10^6 km^3)	Sediments Mass, dry (in 10^{21} g)
Deep oceanic	268	-4 1/2	10 3/4	80.4	217
Suboceanic	93	-1 3/4	17 3/4	372	1,500
Young folded belts	42	1 1/4	37	126	340
Shield areas	105	3/4	35	52.5	140
Volcanic islands	2	1/2	14	--	--

THE HYDROSPHERE[7,8]

	Volume (in 10^6 km)	Mass (in 10^{21} g)
Oceans	1,370	1,420
Lakes, rivers	0.5	0.5
Ice	25-30	25-30
H_2O in atmosphere	0.013	0.013
H_2O in sediments	196	201

ANNUAL EVAPORATION AND PRECIPITATION[7]

	Precipitation (in 10^3 km^3)	Evaporation (in 10^3 km^3)
Oceans	297	334
Land	99	62

ANNUAL RUNOFF[7]

Volume	37 X 10^3 km
Dissolved load	5,402 X 10^{12} g
Suspended load	32,500 X 10^{12} g

1/ Birch, Schairer, and Spicer, G.S.A. Special Paper 36, p. 104, 1942.
2/ Rankama and Sahama, Geochemistry, p. 778, 1942.
3/ Bullen, Introduction to theory of seismology, 1953.
4/ Gutenberg, G.S.A. Special Paper 62, p. 19-34, 1955.
5/ Worzel and Shurbert, G.S.A. Special Paper 62, p. 87-100, 1955.
6/ Press, (oral communication) A.G.U. Transactions, v. 39, p. 528.
7/ Poldervaart, G.S.A. Special Paper 62, p. 120-131, 1955.
8/ Poldervaart, Arie, written communication.

You saw it in GeoTimes . . .

MINERAL CONSULTING SERVICE in geology, geochemistry and geophysics, including continuous recording mobile magnetometer service is available through the recently formed *Heinrichs Geoexploration Co., P.O. Box 5671, Tucson, Ariz.*

AGI Data Sheet 9

The data sheet presented in this issue was prepared by the AGI Data Sheet Committee. Vincent McKelvey and Louis Pakiser of the U. S. Geological Survey assumed primary responsibility for its preparation. They were aided by advice from Francis Birch of Harvard University, George Thompson of Stanford University, Gene Robertson, George Keller, Henry Joesting and James Balsley of the U. S. Geological Survey.

PHYSICAL CONSTANTS (at s.t.p.): A. PLUTONIC ROCKS[1,2,5]

Type	Density (g/cm^3)	Magnetic susceptibility (in 10^{-6} cgs units)	Compressional velocity, near surface (km/sec)	Shear velocity, near surface (km/sec)	Electrical resistivity (ohm - cm)	Thermal conductivity (in 10^{-3} cal/sec cm °C.)
Granite-quartz-diorite	2.5 - 2.9	10 - 4,000	4.0 - 6.5	2.4 - 3.2	10^4 - 10^9	3 - 10
Diorite-gabbro	2.7 - 3.1	70 - 6,000	---	---	10^4 - 10^9	4 - 6
Peridotite-dunite	3.2 - 3.4	7,500 - 15,000	---	---	10^4 - 10^5	---
B. VOLCANIC ROCKS[1,2]						
Rhyolite-dacite	2.2 - 2.7	40 - 60	---	---	10^5 - 10^8	---
Andesite	2.4 - 2.8	60 - 17,000	---	---	10^5 - 10^8	3 - 7
Basalt	2.7 - 3.0	70 - 26,000	3.6 - 5.6	---	10^5 - 10^8	4 - 5
C. SEDIMENTARY ROCKS[1,2,3,5]						
Carbonate rocks	1.8 - 2.9	1 - 20	1.7 - 6.4	1.0 - 3.7	10^3 - 10^6	2 - 12
Shale	1.6 - 2.9	20 - 60	1.8 - 3.9	1.1 - 2.3	10^2 - 10^6	1 - 7
Sandstone	2.0 - 3.2	---	2.5 - 3.9	1.5 - 2.3	10^2 - 10^6	2 - 14
Salt	2.1 - 2.3	-0.5 - -3.0	4.5 - 5.2	2.6 - 3.0	10^3 - 10^8	20 - 300
Anhydrite-gypsum	2.2 - 3.0	-0.4 - -10	3.4 - 5.5	2.0 - 3.2	10^5 - 10^7	---
D. SOME COMMON MINERALS[1,2,5]						
Quartz	2.654	-1 - -1.2	---	---	10^{12} - 10^{28}	---
Calcite	2.717	-0.6 - -1	---	---	10^{14}	---
Magnetite	4.97 - 5.18	300,000 - 800,000	---	---	0.04 - 10^5	---
Ilmenite	4.44 - 4.9	30,000 - 250,000	---	---	100 - 10^5	---
Galena	7.57	---	---	---	0.003 - 80	---
Pyrite	5.018	5	---	---	10^{-3} - 10^4	---
Chalcopyrite	4.283	32	---	---	0.01 - 30	---
Sphalerite	4.083	---	---	---	10^7 - 10^8	---
Hematite	5.26	40 - 300	---	---	0.4 - 10^5	---
Pyrrhotite	4.7	7,000 - 130,000	---	---	10^{-4} - 10	---

THE ATMOSPHERE[4]

Total mass = 5.25×10^{21} g. Height: judged by twilight, 63 km; by meteors, 200 km; by aurora, 46 - 360 km.

	0 km	50 km	100 km	160 km
Pressure (mm Hg):	760	7.5×10^{-1}	4.2×10^{-4}	2×10^{-6}
Density (g/m^3):	1,220	1.3	8×10^{-4}	1.5×10^{-6}

1/ Birch, Schairer, and Spicer, G.S.A. Special Paper 36, 1942.
2/ Heiland, Geophysical exploration, 1940.
3/ Kettleton, Geophysical prospecting for oil, 1940.
4/ Handbook of chemistry and physics, p. 3075, 3076, 1955.
5/ Keller, George V., written communication.

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AGI VISUAL EDUCATION COMMITTEE

The American Geological Institute has organized a new committee on visual education to serve the needs of the profession in this fast moving field. The committee will have several objectives. One will be to revise and update the Directory of Films and Slides of Interest to Geologists, by K. K. Landes, 1951, an AAPG publication turned over to AGI last year.

AGI Visual Education Committee

M. HALL TAYLOR, JR., Chairman
Columbia University
DONALD BOYD
University of Wyoming
FRED BULLARD
University of Texas
JOE S. CREAGER
University of Washington
ROBERT DECKER
Dartmouth College
WAKEFIELD DORT
University of Kansas
HERBERT E. HENDRIKS
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ALAN LUTZ
New Jersey State Teachers College
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University of Wyoming
JOHN H. MOSS
Franklin & Marshall College
PAUL R. SHAFFER
University of Illinois
SHERWOOD D. TUTTLE
State University of Iowa
MALCOLM P. WEISS
Ohio State University
JAMES H. ZUMBERGE
University of Michigan

The committee also is instituting a program of systematic review for new films as they become available. It is seeking to establish standards for evaluation of films for use in elementary and secondary school science education, as well as for college level instruction. The AGI committee is expecting to participate in an interdisciplinary evaluation program to be conducted under the auspices of the NAS-NRC Educational Advisory Board. A grant is being sought to facilitate this program.

New films which are evaluated will be reviewed in a new GeoTimes column Film Fare edited by Dr. M. Hall Taylor, Chairman of the Visual Education Committee.

Persons with ideas and suggestions write to M. HALL TAYLOR, *Dept. of Geology, Columbia University, New York 27, N. Y.*

FILM FARE

by M. HALL TAYLOR, Chairman
AGI Visual Education Committee

To present ideas clearly, forcefully, and enduringly, lecturers know that pictures often provide valuable supplements to words. Teachers particularly like them, for if students in the learning process utilize both their senses of hearing and sight, better learning is likely to result. Well planned visual aid materials such as motion pictures and film strips are available through scattered sources. The quality of these materials varies widely. Through the medium of FILM FARE we will point up availability of such materials and provide appropriate comments in evaluation.

WEST AUSTRALIAN ADVENTURE. A 16 mm color sound movie with running time of 26 minutes. Through 1955 the Western Australian Petroleum Party (Co.), Ltd., had spent some 10 million Australian pounds (about $20 million) searching unsuccessfully for commercial oil reserves in western Australia. Here is the story of that quest, beautifully filmed, showing early exploratory field work, followed by the amphibious landing of more than 2,000 tons of supplies and drilling equipment, preceding the first discovery of oil in Rough Range well No. 1 near the Exmouth Gulf. The picture reviews subsequent seismic, geologic and developmental work which culminated in the drilling of Rough Range Wells No. 2 through 8, all dry holes. For classes in geologic field methods, petroleum geology and economic geology. DISTRIBUTOR: *Western Australian Petroleum (WAPET), Ltd., through the Public Relations Office, California Texas Oil Co. Ltd., 380 Madison Avenue, New York 17, N. Y.*

THE STORY OF COLONEL DRAKE. This beautifully filmed color sound movie, available in both 16 and 35 mm size, retells through 29 minutes the story of "Colonel" Drake who discovered oil in 1859 near Titusville, Pennsylvania by drilling to the then record depth of 69 feet. Commemorating an event historically important to geologists, this four year old film will be particularly appropriate for 1959 centennial celebrations marking the start of the modern oil industry. DISTRIBUTORS: *American Petroleum Institute, 50 West 50th Street, New York 20, New York (loaned free), and many film libraries. For sale at $125 (16mm) and $350 (35 mm).*

THE EARTH AND ITS ATMOSPHERE, *edited by D. R. Bates, F.R.S., Basic Books, Inc., New York, 1957, 324 pp., $6.00.*

This book attempts to present the background for understanding the International Geophysical Year. In general it is successful. The fifteen authors, distinguished scientists all, write about the various geophysical fields of study in the IGY.

Each author has had to compress volumes of data into a short chapter. Most have done this exceedingly well and have preserved the distinction between theory and fact. This is not a book one would read continuously until finished; it is definitely not light reading. Also, some authors presume a knowledge of technical terminology in their fields that is not justified for the bulk of lay readers.

Summing up, I believe the authors have written an interesting book that needed to be written. For a summary of present geophysical knowledge and future needs, it is recommended reading for scientist and non-scientist alike.

J.M.G.

MEASUREMENT OF GEOLOGIC TIME, *Report of the Committee on the Measurement of Geologic Time, NAS-NRC Publication 500; 218 pp.; paper; $1.75. Order from Publications Office, National Academy of Sciences, Washington 25, D. C.*

The Committee on the Measurement of Geologic Time published annual reports from its organization in 1923 until its termination. Its final report, covering the year 1954-1955, has been available for a year but has received little notice. The volume carries the annual review of principal contributions, 190 pages of bibliography annotated by Dr. John Putnam Marble, and translations of two significant Russian papers. The bibliography carries annotations which include full statements or tabulations of analytical results; the annotations also indicate when references lack analytical data or geologic detail. A few titles which might tempt the investigator of geochronology to search out the reference are also included with an appropriate annotation to show they do not contain information bearing on the measurement of geologic time.

The report for 1954-1955 forms a link between previous annual reports and the bibliographic services now being performed by abstracting organizations such as the *Geophysical Abstracts* of the U. S. Geological Survey and *Chemical Abstracts.*

OIL FROM PROSPECT TO PIPELINE, *by Robert R. Wheeler and Maurine Whited, 115 pp., 1958, Gulf Publishing Co., Houston, Texas, $2.95.*

This book fills a distinct gap in the literature of the oil industry. Probably every consultant or independent has at one time or another, felt the need for a compact book that explained petroleum exploration and production in simple terms. Mr. Wheeler and Mrs. Whited have done a commendable job in filling this need.

Perhaps the chapters on technical operations tend to assume too much of a scientific background on the part of the reader; however, it is difficult to see how such a complex mass of information could have been put in a limited space without this assumption. The remainder of the book which is devoted to ownership, economics, types of deals, terminology, and abbreviations, is written with conciseness and clarity. The nominal cost of the book should enable every independent to place a few copies in the hands of prospective oil investors, where it should perform a valuable function in educating the general public on the workings of the oil industry.

A.M.B.

PETROLEUM SOURCEBOOK 1958, *Curtis Stevens, Editor, 179 pp., National Petroleum Bibliography, Box 3586, Amarillo, Texas, $6.00.*

This new book covering the year 1957 is the first of an annual series designed to place in one volume the location of important literature on the petroleum industry. Material from more than 500 publications including nearly 100 trade magazines and journals is classified by geographic regions. The publication is a valuable reference for the oil and gas industry.

P.B.

LEXICON OF PRE-PENNSYLVANIAN STRATIGRAPHIC NAMES OF WEST TEXAS AND SOUTHEASTERN NEW MEXICO, *by Lexicon Committee, Louise Fillman, Chairman, West Texas Geologic Society. 153 pp., 6 figs., 1 correlation chart. 1958. West Texas Geological Society, P. O. Box 1595, Midland, Texas. Price $5.00 (50¢ additional for mailing and/or invoicing).*

Information about each of the 145 stratigraphic units included in this lexicon is arranged, with only a few variations, according to name, age, type local-

ity, original author, original definition, redefinition (or history), lithological characteristics, thickness and distribution, stratigraphic position, correlation, references, and name of contributor. In addition, the lexicon contains six maps showing the general distribution of the more widespread units, a list of alphabetized unit names under each of the pre-Pennsylvanian systems, a selected bibliography of 157 references pertinent to the lexicon, and a pre-Pennsylvanian correlation chart. Dr. Louise Fillman, Chairman of the Lexicon Committee of the West Texas Geological Society, and twenty-six other geologists and paleontologists contributed to this excellent publication. It should be of great value not only to geologists working in this area but also to all geologists interested in pre-Pennsylvanian stratigraphy. Also, it should serve as an excellent supplement to the familiar Lexicon of Geologic Names of the United States.

W.A.W.

TEACHING AIDS AND ALLIED MATERIALS IN ENGINEERING GEOLOGY, *prepared by Teaching Aids Committee, Geo. A. Kiersch, Chairman, GSA Div. on Engineering Geology, 36 pages, 1958, Geological Society of America, 419 W. 117th St., New York 27, N. Y. Price $0.75.*

This publication contains invaluable information for the student, instructor, or practicing geologist alike. Both the subject area and a professional engineering geologist are defined. Context of three courses offered by colleges is described—Geology for Engineers, Applications of Geology for Engineers, and Engineering Geology; Engineering Geology is for trained geologists only. Textbooks and treatises widely used in courses are tabulated, as are texts in preparation, case histories released or in publication by the Division, typical research projects under way, and committees compiling data of interest to Division members.

Appendices cover such information as: list of colleges offering a major in Engineering Geology with descriptions as distinguished from broader geological engineering curriculum, lists of schools offering the three courses, details on 48 motion pictures appropriate for teaching courses, and data on many others, field and laboratory exercises, a suggested undergraduate course of study for preparation in Engineering Geology by either Liberal Arts College or Technical College approach with fifth year at a Technical College, and a list of organizations in United States employing engineering geologists.

ELEMENTARY SEISMOLOGY

by Charles F. Richter

The author, a world authority in his field, has collected for his book a wealth of fascinating material covering all earthquakes described in accessible literature as associated with faulting. Published in August, the book shows the general relation of faulting to earthquakes. Many photographs, references and appendixes are included. The book is in three parts: I Nature and Observation of Earthquakes. II Geography and Geology of Earthquakes. III 16 Appendixes. *205 figs., 47 tables, 768 pp. $12*

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MR. DAVE ORGAN
Calgary, Alberta

Please accept our apologies for not having replied sooner to your letter regarding *TIME*'s April 7 [1958] report, *"Arctic Search."* An unusually heavy reader response has delayed some of our correspondence.

In stating that drill rigs "must be anchored to granite" we did not mean that the terrain in which the drilling took place was granite. On the contrary, because of the presence of shale in this area, granite outcroppings had to be found to make such a solid base.

Thank you for the interest in *TIME* which prompted your writing to raise this question.

Cordially yours,
MARIE BARRY
For the Editors
TIME MAGAZINE

EDITOR'S NOTE: *How about that?*

DEAR DR. GRABENHORST:

I should like to comment on your letter to the editor in the October, 1958, issue of *"GeoTimes"* about an article that I wrote which appeared in the March, 1958, issue of the Bulletin of the AAPG. The title of this paper was *"Chief Tool of the Petroleum Exploration Geologist: The Subsurface Structural Map."* You will note from the title of the article that its subject is not the general subject of geology nor of geologists, but rather one tool among many tools used by these geologists who are searching for petroleum. That single tool is the subsurface structural map. My paper concerned itself with the preparation and uses of this map. Nowhere in it was there any claim made that this was the only method by which oil could be found.

You seem quite concerned because of my statement that "many geologists in the Gulf Coast have never prepared a sample log." This is because they have discovered long ago that the electric log is their best tool for determining exact boundaries between shales and sands in wells drilled with rotary tools and limited coring in the Tertiary beds of the Gulf Coast. These boundaries are used for correlation between the various wells. The rocks encountered by the drill have very definite electrical characteristics because of the fluids in the interstices of the beds. These electrical characteristics are as definitive of sand and shale as are their physical characteristics of texture, grain size, color, mineral content, etc. Why should a geologist in the Gulf Coast prepare a sample log when an electric log can give him much more accurate results? If you do not believe this is true, ask any geologist working in the Gulf Coast who has attempted to correlate sample logs before the advent of electric logs.

You also seem concerned about the section entitled "Field Mapping." More properly it might have been titled "Mapping of Oil and Gas Producing Fields." On the other hand, I am sure that surface "Field Mapping" could also more properly be described as "Mapping of Surface Geology in the Field." I refer again to the title of the article under discussion. Surface mapping of geology in the field is outside the province of the article, subsurface mapping of oil fields is not. As a matter of fact, the word "electric log" was used only once in the section titled "Field Mapping." The discussion of electric logs was not "all about electric logs" but was confined to their uses in correlation and was described under the general subdivision of *WELL INFORMATION*, the lesser subdivision of *WELL LOGS* and the still smaller subdivision of Electric-log correlation.

As you probably realize, the petroleum industry employs more geologists than does any other industry, agency, etc. They employ them, and will continue to employ them, only so long as they are convinced that the geologic principles that they apply are an efficient method for the discovery and development of petroleum reserves. This applies to any "variety" of geologist. Personally I do not feel that it is a disgrace to work for an oil company and search for oil as efficiently as I know how. So far this has not entailed telling someone that he has rocks in his head in Latin.

You might be interested in other reactions to this article. I have received requests for reprints from as far away as Libya and Venezuela. One major oil company has reproduced it and furnished a copy to each of its younger geologists. Several college teachers have requested

reprints for use in their classes. Of all these letters, only two, yours and one other, condemned it. This other letter, based on an incomplete version of the paper, appeared and was answered in a recent issue of The Oil and Gas Journal.

You may not agree to the methods as set forth in my article, but you will have to admit that I have guts enough to sign it and this letter with my own name.

Yours very truly,

LOUIE SEBRING, JR.

DEAR EDITOR:

I conclude from Letters, October GeoTimes, that Dr. Grabenhorst and possibly God Almighty would qualify as "geologists" in the true sense of the word.

Lovingly,

DR. STEININKOPF

DEAR SIRS:

My opinion of your magazine dropped considerably when Dr. Grabenhorst turned literary sniper.

Yours very truly,

M. B. HANSEN

DEAR EDITOR:

The excitable Dr. Grabenhorst sounds like he was un-horst in his own graben (*Geotimes, October, pp. 35-36*). He builds up a big case based on Webster's definition of geology and concludes that making subsurface structure maps is not geology! Since when is the delineation of folds and faults not "pertinent to the elucidation of earth history?" Since when do geologists rely on Webster for their technical definitions? In the same issue (p. 7) Carey Croneis deplores such disunity among geologists. The very backbone of the AGI is that we earth scientists are all geologists and should stick together. Geology is our major, but some of us minor in structure contouring or calyx measuring. Would he say a dermatologist is not practicing medicine?

Incidentally what is that blank in Dr. G's letter where innocent geologists get bamboozled? His point here lacks authority.

"Duo saxa manura."

Yours in unity,

ANDY CLINE

DEAR EDITOR:

GeoTimes is getting better and better! I am much pleased with the way you are supporting the National Park Service and "Mission 66" especially the Committee you

announcing . . . .

GeoScience Abstracts

Beginning in January 1959 GeoScience Abstracts will replace Geological Abstracts which has been published by the G. S. A.

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Petroleum Geology

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Write to: **Petroleum Geology 533 Harden St. Columbia, S. C.**

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Calgary, Alberta

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You seem quite concerned because of my statement that "many geologists in the Gulf Coast have never prepared a sample log." This is because they have discovered long ago that the electric log is their best tool for determining exact boundaries between shales and sands in wells drilled with rotary tools and limited coring in the Tertiary beds of the Gulf Coast. These boundaries are used for correlation between the various wells. The rocks encountered by the drill have very definite electrical characteristics because of the fluids in the interstices of the beds. These electrical characteristics are as definitive of sand and shale as are their physical characteristics of texture, grain size, color, mineral content, etc. Why should a geologist in the Gulf Coast prepare a sample log when an electric log can give him much more accurate results? If you do not believe this is true, ask any geologist working in the Gulf Coast who has attempted to correlate sample logs before the advent of electric logs.

You also seem concerned about the section entitled "Field Mapping." More properly it might have been titled "Mapping of Oil and Gas Producing Fields." On the other hand, I am sure that surface "Field Mapping" could also more properly be described as "Mapping of Surface Geology in the Field." I refer again to the title of the article under discussion. Surface mapping of geology in the field is outside the province of the article, subsurface mapping of oil fields is not. As a matter of fact, the word "electric log" was used only once in the section titled "Field Mapping." The discussion of electric logs was not "all about electric logs" but was confined to their uses in correlation and was described under the general subdivision of *WELL INFORMATION*, the lesser subdivision of *WELL LOGS* and the still smaller subdivision of Electric-log correlation.

As you probably realize, the petroleum industry employs more geologists than does any other industry, agency, etc. They employ them, and will continue to employ them, only so long as they are convinced that the geologic principles that they apply are an efficient method for the discovery and development of petroleum reserves. This applies to any "variety" of geologist. Personally I do not feel that it is a disgrace to work for an oil company and search for oil as efficiently as I know how. So far this has not entailed telling someone that he has rocks in his head in Latin.

You might be interested in other reactions to this article. I have received requests for reprints from as far away as Libya and Venezuela. One major oil company has reproduced it and furnished a copy to each of its younger geologists. Several college teachers have requested

reprints for use in their classes. Of all these letters, only two, yours and one other, condemned it. This other letter, based on an incomplete version of the paper, appeared and was answered in a recent issue of The Oil and Gas Journal.

You may not agree to the methods as set forth in my article, but you will have to admit that I have guts enough to sign it and this letter with my own name.

Yours very truly,

LOUIE SEBRING, JR.

DEAR EDITOR:

I conclude from Letters, October GeoTimes, that Dr. Grabenhorst and possibly God Almighty would qualify as "geologists" in the true sense of the word.

Lovingly,

DR. STEININKOPF

DEAR SIRS:

My opinion of your magazine dropped considerably when Dr. Grabenhorst turned literary sniper.

Yours very truly,

M. B. HANSEN

DEAR EDITOR:

The excitable Dr. Grabenhorst sounds like he was un-horst in his own graben (*Geotimes, October, pp. 35-36*). He builds up a big case based on Webster's definition of geology and concludes that making subsurface structure maps is not geology! Since when is the delineation of folds and faults not "pertinent to the elucidation of earth history?" Since when do geologists rely on Webster for their technical definitions? In the same issue (p. 7) Carey Croneis deplores such disunity among geologists. The very backbone of the AGI is that we earth scientists are all geologists and should stick together. Geology is our major, but some of us minor in structure contouring or calyx measuring. Would he say a dermatologist is not practicing medicine?

Incidentally what is that blank in Dr. G's letter where innocent geologists get bamboozled? His point here lacks authority.

"Duo saxa manura."

Yours in unity,

ANDY CLINE

DEAR EDITOR:

GeoTimes is getting better and better! I am much pleased with the way you are supporting the National Park Service and "Mission 66" especially the Committee you

announcing . . . .

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LETTERS—*Continued from page 25*

have appointed to assist and advise N.P.S.

I have been interested in "exposing" the "public to geology" for many years. They will absorb a lot of it if we use the English language and define our technical expressions.

Sincerely,

C. MAX BAUER

DEAR EDITOR:

An unfortunate statement in the article *Stanford's School of Mineral Sciences Gets Critical Review* (*GeoTimes, September 1958*) creates the erroneous impression that the teaching of geophysics at Stanford might be emphasized to the exclusion of geophysical research. On the contrary, we recognize that effective teaching at the graduate level is intimately related to research, depends upon research, and is impossible without research.

Our objective is to develop and expand research in fundamental geophysical problems and at the same time to build a balanced program of geophysical education. The recommendation which created the false impression actually meant that research should not be emphasized to the point of neglecting excellence in teaching and that we should not become *primarily* a research institute.

Sincerely yours,

GEORGE A. THOMPSON
Department of Geophysics

DEAR EDITOR:

The report of the Stanford Alumni committee on the Stanford School of Mineral Sciences, as reported in the September GeoTimes should receive wide attention. It appears that the major problem of our schools has been a needless one. What is now urged is a "high student-faculty ratio (7:1 or better)," which should present no problem at all in present times.

Yours very truly,

DOAK C. COX
Experiment Station
Hawaiian Sugar Planters' Association

You saw it in GeoTimes . . .

HUNTING GEOPHYSICAL SERVICES, INC. is a new member of the more than 40 diversified Hunting companies. More information on this new company organized to serve clients in the U. S. and Mexico for airborne and ground geophysical surveys may be had by writing the new company at *57 Park Ave., New York 16, N. Y.*

VEMA

A much travelled lady

Who could ask for a better companion—a lady geologist with an itchy foot—or could it be her beam? This lady is a member of the Department of the Lamont Geological Observatory of Columbia University. Like all lady geologists she is rugged and dependable; she weighs 553 tons and is 202 feet tall—or is it long? Unlike most ladies, she is diesel-powered and believe it or not has *three* protruding features. Oh, but you're wrong! She is not a freak; she is every inch a lady—the proud three-masted oceanographic research vessel —VEMA.

In early September the VEMA returned from a 10-month data collecting voyage on which she covered nearly 34,000 miles and made 18 ports of call. This was the first voyage during the IGY but the 14th for the VEMA.

Under the leadership of Dr. Maurice Ewing, Professor of Geology at Columbia, a scientific complement of 10 to 14 men collected varied oceanographic data as the ship sailed southward across the Atlantic around the Cape into the Indian Ocean, the Red Sea, the Gulf of Aqaba, the Mediterranean Sea, then home. A continuous record of depth soundings provided new data on submarine topography, and continuous records of the earth's magnetic field were also made. Aided by three other oceanographic vessels seismic refraction profiles of the ocean's bottom were made. Ocean bottom cores were also collected along the route. Data on the properties of the atmosphere and the ocean at various depths was gathered throughout the voyage. The VEMA took photographs of the ocean's bottom at 62 stations and at one in the Atlantic off South America recorded ripple marks deep on the ocean floor.

The VEMA, like all lady geologists, is indefatigable, for after a brief home stay of about a month she set out in mid-October for another 10-month voyage. This trip will take her south through the Caribbean and the Panama Canal. She will round the Strait of Magellan, across the Atlantic to Africa and follow the West Coast of Africa northward. She will return to New York via the Caribbean.

Geological and geophysical data collected on this expedition may provide critical new evidence concerning the geologic history of the Caribbean and the area of the Atlantic Ocean lying between Africa and South America. The VEMA's scientists will study comparatively the faunal relations in the Caribbean and Pacific deeps. Bottom samples will be taken by the "coring" apparatus.

Off the Tierra del Fuego area at the extreme tip of South America the VEMA will be joined by two Latin sisters from Chile and Argentina and the three will do a seismic refraction "rhumba" in the fjord-like channels among the islands. Moving on from this pleasant sojourn the VEMA's scientists will concentrate on adding to the oceanographic knowledge of the strategic channel between the Atlantic and Pacific Oceans—the Drake Passage.

Yes, the VEMA is every inch a lady and she leads her male geoscientist companions on a very merry and educational chase.

Graduate and Post Doctoral Fellowships

The National Science Foundation anticipates the awarding of 1,000 graduate and 200 postdoctoral fellowships for scientific study in 1959-1960 in its eighth annual Fellowship program. The fellowships are open to U. S. citizens only and awards are made on the basis of ability. Screening of the applications will be conducted by the National Academy of Sciences-National Research Council.

The awards will be announced on March 15, 1959. Closing date for the predoctoral fellowship program is January 5, 1959. The postdoctoral applications must be received by December 22, 1959.

For information and application materials write to *Fellowship Office, NAS-NRC, 2101 Constitution Avenue, Washington 25, D. C.*

1878—Cosmos Club—1958

The Cosmos Club of Washington commemorated the 80th Anniversary of its founding by paying tribute to John Wesley Powell, geologist, who on the evening of November 18, 1878, gathered together a group of Washington scientists for discussions which led to the chartering of the club.

Dr. Matthew W. Stirling, noted authority on Major Powell, was the principal speaker of the evening and a bronze plaque was unveiled to officially christen the John Wesley Powell Auditorium.

THE OIL FINDER—*Continued from page 7*

the Big Horn Basin of Wyoming. It is also helpful from a regional viewpoint in determining areas where the hydrodynamic gradient is favorable or unfavorable for petroleum accumulations. The study of hydrodynamics is in its infancy, but is already contributing to the exploration effort. The integrated and team effort of the geologist and geophysicist is the best method yet devised in the field ot exploration. These two great oil finding arts no longer can be separated. Blending of the two enhances the odds for success.

Fundamentally, both geologist and geophysicist must possess the same qualifications—enthusiasm, imagination, curiosity, daring and a basic knowledge of oil occurrence. The term "Explorationist" has been applied to individuals comprising these two groups. It is most appropriate and deserves common usage.

There is no substitute for hard work. A wildcat well demands the diligent watchfulness of an infant, and one does not raise children on a 40-hour week. Imagination evolved from sound geologic facts and tempered with practical judgment is also necessary. Competitors' data is equal to yours. The manner in which creative imagination is applied to interpret the data will determine the success of a venture.

Failures must not dampen enthusiasm. The odds are against explorationists from the beginning. When a venture is inaugurated the chance for a successful commercial completion is one in 44. Each defeat requires thorough analysis because it may be a link toward a future major success. Knowing that success may follow failures, this spurs the explorationist on to greater efforts.

Optimism must not go unbounded, because optimism cannot cure a dead horse.

Faith in Self Is Important

Intellectual honesty is a must. The risks are great and large sums of money are expended on the geologist's recommendations. But the geologist must never lose faith in his own capacity to locate oil. Above all he should adhere to the ethics of his profession and be an honorable citizen of his community.

Even though many in the profession are mature, experienced, and recognized as geologists, all geologists are not "oil finders." I estimate that the ratio of oil finders to geologists is about one in twenty. Fortunately the industry needs both types, but it is the "oil finder" who keeps his company alive. His ability is unique in that within limits he pinpoints areas of accumulation. He is regarded as having the magic touch. To become an "oil finder" one must develop the ability to apply his experience in all new situations. The non "oil-finders" seldom find the forest because of the trees.

CARBONIFEROUS CONFERENCE

A report by
Max K. Elias

The gathering of the World's specialists on the Carboniferous at Heerlen, September 15 through 20 was saddened by the absence of the initiator of the Carboniferous Congress, Prof. Dr. W. J. Johngmans, who died early this year in the midst of preparations for the 4th Congress. The efforts by his associates and friends to make the Congress better than ever, thus honoring Johngman's memory, resulted in a good attendance (over 200 scientists) and the excellency of many papers presented.

The discovery of several major coal basins in northern Siberia reported by the chief Russian delegate I. I. Gorsky (with I. I. Molchanov), and the new elements in the Gondwana flora, with peculiar combination of male and female fructification arising from the middle of broad leaves, described by Mrs. E. Plumstead of South Africa, were among the most unexpected contributions. All three American reports were read in the main sessions of the program. Dr. Harold Fisk (head of the Research Center of the Humble Oil and Refining Company at Houston, Texas) lectured on the Mississippi delta; Dr. Potter of the Illinois Geological Survey—on the late Mississippian and early Pennsylvanian river systems in Illinois; and Dr. M. K. Elias reviewed the Carboniferous of America, Western Europe, and Eastern Europe with emphasis on major boundaries and straddle formations.

A new major stratigraphic name, *Silesian*, was introduced for the Upper Carboniferous of Western Europe by the newly organized international Subcommission on Carboniferous stratigraphy; Mackenzie Gordon, Harold R. Wanless, and Maxim K. Elias representing the USA on the Commission.

A more complete report on the Congress is in a state of preparation and is expected to be published in an early issue of AGI's new journal, International Geology Review.

ROCK CHIPS

by SANDSTONE SAM

Left: Cartoon by Mort Kline, reprinted by courtesy of News Letter, Pacific Section AAPG.

° ° °

A student's explanation: "A fossil of particular importance in this theory (Gondwana land) is the Glossopteris Fossil which is usually found in glaceriated tilliate. If the continents were at one time connected this would explain how the land animals and plants got around the earth. Also, since some people tie geologic history and the Bible together, this would explain how man got all over earth if he was formed through evolution in Africa."

° ° °

A geologist feller named Gale
Was measuring a thick section of shale
"A fossil," he cried
As he started to slide
And bounced down the slope on his tail.

° ° °

Stock brokers are following with keen interest the progress of Tall Timbers, Inc. of Texas. The company is reported to be buying fantastically large numbers of well logs. Informed sources say these will be cut up into planks to be used in shoring up the Texas ego which has sagged so badly since Alaska was accepted as the 49th and largest state.

You saw it in GeoTimes . . .

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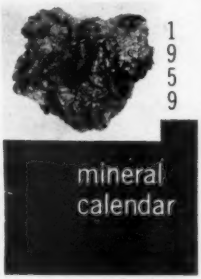

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INFORMATION WANTED

Concerning location of Journals, diaries, or notebooks of Dr. F. V. Hayden, head of U.S. Geol. and Geog. Survey of the Territories. Such records known to have been kept by him but not now in U.S. Archives, USGS Field Archives or with his voluminous correspondence files. These are needed in historical study now in progress by Dr. F. M. Fryxell and the undersigned.

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EXPERIENCED GEOLOGIST, 25-40 yrs., with extensive knowledge U.S. mining (and oil, industries and of modern airborne geophysical techniques required at New York headquarters leading international service concern. Imagination and sales ability important. BOX 99.

MINERALOGIST-PETROGRAPHER, able to make sight determinations. Experienced in optical and polished section techniques. Familiarity with x-ray desirable. Work in identifying public samples and in doing petrographic work related to geologic and ore dressing problems. Colorado School of Mines Research Foundation, Golden, Colorado.

CALTEX seeks Airphoto Geologist—initial assignment Sumatra, Indonesia. Minimum requirements—Master's Degree in Geology to include one year of Micropaleontology and at least one year's experience each in Geological Airphoto Interpretation and subsurface Petroleum Geology. Submit detailed resume and college transcript to: Employment Section, California Texas Oil Company, Ltd., 380 Madison Avenue, N. Y. 17, N. Y.

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Excellent opportunity for experienced geologist to develop department of geologists, ore dressing technicians, surveyors, drillers, samplers, draftsmen, computers, and clerks—total of 60. Principal functions of department are:

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- Mineral examinations – distant high-grade deposits

Need well-trained college graduate, with 5 years or more experience who can effectively handle all of above functions for iron mining company in Texas. Salary from $700 up, to start, depending upon qualifications.

Write GEOTIMES, Box 100

POSITIONS WANTED

BOX 398. WHO NEEDS A 29 year old, married exploration geologist with varied mineral deposit experience who can write? Has written articles and reports for all levels of geological interest and knowledge. Open to any attractive offer.

BOX 481. RESEARCH PETROLEUM GEOLOGIST-STRATIGRAPHER, 30, M.S. Extensive experience in most provinces U.S. and Canada. Have utilized newer exploration tools; Entropy Lithofacies mapping, Gamma-Halo surveys, porosity maps, moment maps, etc. Desire position of responsibility in research or exploration. Executive ability.

BOX 483. PETROLEUM-GEOLOGIST, M.S. 30. Diversified experience: subsurface, research, teaching. Knowledge of Texas, mid-cont., Rocky Mts., Appalachian, Canada. Creative thinker, aggressive, proven oil finder, capable of organizing or operating exploration or research group. Desire domestic or foreign position of responsibility.

BOX 498. GEOLOGIST, Ph.D., 34, married, desires permanent teaching career. Background in sedimentation, sedimentary mineralogy and geochemistry, petroleum geology, principles of stratigraphy. Presently employed as research geologist by major oil company. Two years' teaching experience in small university.

BOX 502. GEOLOGIST, experienced explorationist with diversified background needs more responsible position. Experience includes subsurface studies, supervision and seismograph.

BOX 509. ENGINEERING GEOLOGIST, Ph.D. 40. Broad experience General and Engineering Geology, Ground Water, Nonmetallics, Structural Geology; also 4 years university teaching same. Excellent references, many publications, active research. Seeks teaching position university or engineering college, esp. to offer courses engineering geology field.

BOX 513. GEOLOGIST, M.S., considerable experience in petroleum geology. Formerly major company division geologist. Have executive and administrative ability. Desires foreign contract. Now consultant.

BOX 516. PETROLOGIST, ECONOMIC GEOLOGIST, MINERALOGIST, 37, Ph.D. from leading Eastern University, 8 years post-Ph.D. experience in teaching, research and exploration, with research publications, is interested in academic position. Fields of interest include all phases of petrography and petrology, ore deposits and uranium, petroleum and industrial minerals, sedimentation, geo-chemistry, elementary mineralogy and crystallography.

BOX 517. PETROLEUM GEOLOGIST, M.S., family, desires to relocate in Alaska. Diversified Arctic, Mid-continent, and Rocky Mountain experience. Currently employed by major oil company. Specialties include photogeology, surface and subsurface structure, stratigraphy. Creative thinker with leadership and administrative ability. Excellent references.

BOX 520. GEOPHYSICIST. B.S. in geology, 10 years seismic experience including 4 years party chief and 2 years review work. Presently employed. Wants responsibile job requiring both administrative and technical ability. Wil go anywhere. Rocky Mountain area preferred.

BOX 527. STRATIGRAPHER-PALEONTOLOGIST, Ph.D. before June 1959, 32, family. Four years varied petroleum experience, two years as university professor teaching historical, paleontology, stratigraphy. Research in Pennsylvanian-Permian microfaunas and stratigraphy. Will consider petroleum or teaching position. Resume on request. Available June 1959.

BOX 528. GEOCHEMIST, Ph.D., 34, married. Interested in teaching and/or research in geochemistry, high temperature-high pressure crystal chemistry, phase rule, and all phases of mineralogy. Extensive experience in X-ray diffraction and microscopy. Publications. Industrial experience.

POSITIONS WANTED—*Continued*

BOX 530. GEOLOGIST, 30, vet., single, B.S., some graduate work in mining geology. Two years experience in petroleum exploration. Desires position in mineral exploration, domestic or foreign. Available immediately.

BOX 531. GEOLOGIST, M.A., Ph.D. nearly completed, 29. Diversified domestic and foreign experience (including geophysics). Foreign oil or engineering position desired. Resume on request. Available: Nov. 1958.

BOX 532. GEOLOGIST-GEOPHYSICIST, 8 years experience glacial-groundwater and mineral exploration Lake Superior country; 13 years coordinating all phases oil exploration from off-shore Gulf to Canada and Illinois to Nevada. Desires responsible position directing geophysical program or as exploration coordinator where wide training and experience, better than average ability, and a capacity for hard work can all be utilized. Prefer Rocky Mountain location. Excellent references.

BOX 533. GEOLOGIST, 28 family, BS 53, 1 yr. seismograph experience, 4 yrs. U. S. Army, desire geological or geophysical employment in North America.

BOX 534. PALEONTOLOGIST-GEOLOGIST, 28, M.A. 137 hours science, 47 business. Experienced writer. Curatorial assistant. Summer work: Latin America (surface), East (groundwater). Prefer paleo-stratigraphy. Consider anything in domestic petroleum.

BOX 535. GEOLOGIST-PHOTOGRAMMETRIST, BA, 27. Four years experience in airborne surveys and all phases of photogrammetry including planning and administration. Desires position in U.S. or overseas. Resume on request. Available January 1959.

BOX 536. GEOLOGIST, Ph.D., 30, family, desires teaching and research position in college or university, or research work with petroleum company. Principal fields micropaleontology and stratigraphy. Also proficient in sedimentology and petrography. Industrial and teaching experience.

BOX 537. GEOLOGIST (Mineralogist-Petrologist), 39, married, Ph.D., Teaching experience. Ten years experience in economic geology in Central Africa: exploration, development, mineral evaluations, geochemical prospection, microchemistry. Presently in charge of a prospection department. Seeks worthwhile change (industrial or teaching position, preferably overseas). Excellent references.

BOX 538. PETROLEUM GEOLOGIST, B.A., 27. Have worked 5½ years in all basins of California with minor oil company. Proficient in all phases exploration and exploitation geology. Creative thinker, oil finder, love geology. Would like to work in Rockies or Mid-continent.

LECTURING OR RESEARCH POSITION for Australian geologist on sabbatical leave for one year from September 1959. Specialist in economic geology and engineering geology. Wide experience, outstanding lecturer, age 47, married. Professor A. S. Ritchie, N.S.W. University of Technology, Newcastle University College, Tighe's Hill, N.S.W., Australia.

BOX 539. GEOLOGIST, B.A., Minor in Economics, family, veteran. Desires position as geologist in Mid-West, Rocky Mt. area or Alaska. Available immediately.

BOX 540. GEOLOGIST, Ph.D., 29 married, desires teaching or survey position with research opportunities. Interested in general geology, petroleum geology, sedimentation, stratigraphy, paleontology, glacial geology, geomorphology. Three years experience as research geologist with major oil company.

BOX 541. EXPLORATION GEOLOGIST-GEOPHYSICIST, B.S. Math., M.S. Geology, 33. Eleven years seismograph and subsurface interpretive experience in the Gulf Coast. Supervisory experience.

BOX 542. GEOLOGIST, M.S. in Sept. 1958, 26, married. Interested all phases of geology. Desire position either in or outside of the U.S. Resume sent on request.

BOX 543. GEOLOGIST with 4 years varied experience in oil, groundwater, and sales engineering desires to relocate. Consider any type of work with starting salary of $7200 per year. Should have $10,000 year potential.

BOX 544. GEOLOGIST, B.S., 27, family. Desires to gain more experience in all phases of geology. Open to any reasonable offer in geology or allied field. Foreign or domestic.

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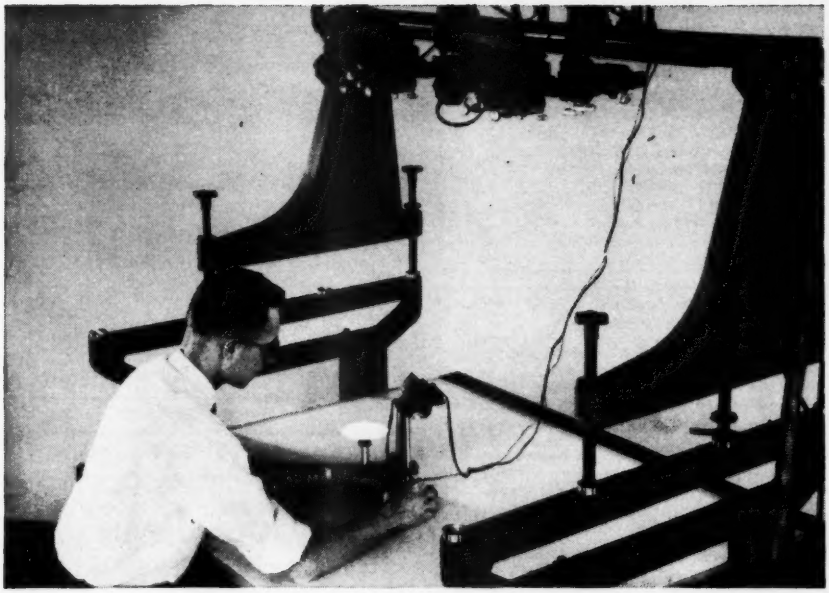

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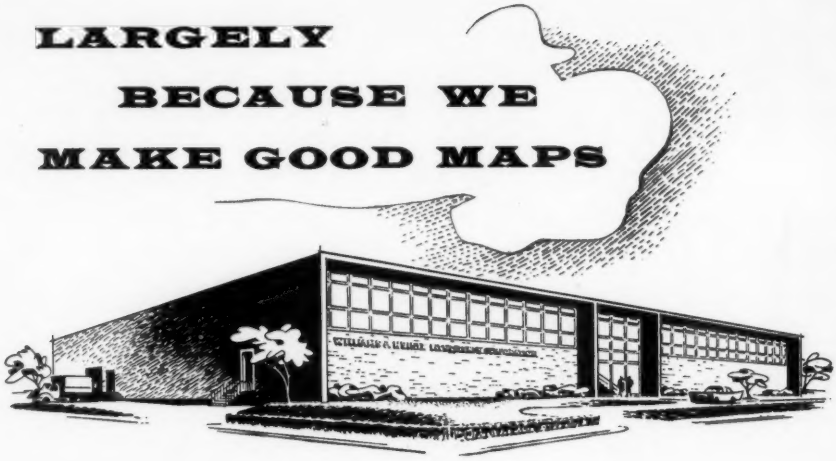

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